Page

District heating station

Services

Description

Hoval TransTherm giro

District heating transfer station
- Indirect compact station for heat transfer and regulation of heating and hot water production systems.
- Standard design for heating water in accordance with DIN and AGFW directives.
  District heating primary:
  - maximum pressure stage 16/25 bar
  - maximum operating temperature 110-150 °C
  - maximum volume flow 4.5 m³/h
  - connections - standard design left, conversion to the right on site.

  Secondary heating:
  - maximum operating pressure 3 bar
  - maximum operating temperature 95 °C
  - maximum volume flow 6.5 m³/h
  - connection optional, top and/or bottom.

Option
- Special design for other requirements and district-heating-specific requirements on request.

- Installed:
  District heating primary:
  - 1 volume flow controller with motorised valve, actuator without emergency control function (110 °C) with emergency control function (140, 150 °C)
  - 1 heat meter adapter
  - 1 return temperature sensor
  - 1 flow temperature sensor
  - 1 strainer
  - 1 drain

  Secondary heating:
  - stainless steel plate heat exchanger, copper-soldered design
  - 1 return temperature sensor
  - 1 flow temperature sensor
  - 1 safety temperature monitor (140, 150 °C)
  - 1 safety valve 3 bar
  - 1 pressure gauge
  - 1 strainer
  - 1 drain
  - 1 connection for expansion tank

- District heating station in fully welded and thermally insulated design (100 % thermally insulated), in powder-coated sheet aluminium casing, colour pure white (RAL 9010).
- TopTronic® E controller installed

TopTronic® E controller

TopTronic® E control panel
- Colour touchscreen 4.3 inch
- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

Series TransTherm giro Type	Hydraulics	Number of plates (heat exchanger)	Max. flow temperature °C	nominal pressure bar	Heat output [1] kW
(H0/N10/T110/P16)	0	10	110	16	26
(H0/N10/T140/P16)	0	10	140	16	26
(H0/N10/T150/P25)	0	10	150	25	26
(H0/N20/T110/P16)	0	20	110	16	64
(H0/N20/T140/P16)	0	20	140	16	64
(H0/N20/T150/P25)	0	20	150	25	64
(H0/N40/T110/P16)	0	40	110	16	128
(H0/N40/T140/P16)	0	40	140	16	128
(H0/N40/T150/P25)	0	40	150	25	128
(H0/N60/T110/P16)	0	60	110	16	151
(H0/N60/T140/P16)	0	60	140	16	151
(H0/N60/T150/P25)	0	60	150	25	151
(H0/N80/T110/P16)	0	80	110	16	189
(H0/N80/T140/P16)	0	80	140	16	189
(H0/N80/T150/P25)	0	80	150	25	189

[1] Reference temperature primary 90-53 °C / secondary 75-50 °C

TopTronic® E basic module district heating com (TTE-FW com)
- Control functions integrated for
  - primary valve control
  - cascade management
  - 1 heating circuit with mixer
  - 1 heating circuit without mixer
  - 1 hot water loading circuit
  - various additional functions
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Complete plug set for DH module

Options for TopTronic® E controller
- Can be expanded by max. 5 module expansions:
  - module expansion heating circuit DH
  - module expansion hot water DH
  - module expansion universal DH
- Can be optionally expanded with various accessories:
  - Ethernet connection TTE-FW com
  - repeater TTE-FW com LON bus
  - router TTE-FW com Ethernet on LON bus
  - data socket 13-pin TTE-FW com LON bus and lighting protection
  - various software licences for HovalSupervisor
  - various services for HovalSupervisor
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module
  - e.g. max 45 mixer circuits

Number of modules that can be additionally installed in the control panel:
- 2 module expansions district heating and 1 Ethernet connection TTE-FW com
- Free space top-hat rail 310 mm

Further information about the TopTronic® E
see “Controls”

Design on request
- Volume flow controller with motorised valve, actuator with emergency control function
- Supply of system components such as heat meter, heating armature group, calorifier, loading group etc.
- Special design for requirements deviating from the standard or specific requirements for district heating networks.
- Hoval control system
- District heating station for direct heat transmission

Delivery
- District heating transfer station, fully cased and ready for electrical connection.
- Delivered in separate packaging:
  - Temperature sensor set for TopTronic® E

On site
- Installation of heat meter

Part No.

Hoval TransTherm giro

District heating transfer station Hoval TransTherm giro — **Part No.**

Indirect compact station for heat transfer and control of heating and water heating plants with built in Hoval TopTronic® E control for controller district heating systems in communicative networks (communications interface to the instrumentation and control system) and the associated consumers

Control function integrated for:
- primary valve control
- cascade management
- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- various additional functions

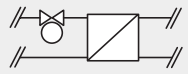
• Can be optionally expanded by max. 5 module expansions:
- module expansion heating circuit DH
- module expansion hot water DH
- module expansion universal DH

• Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Incl. outdoor sensor, immersion sensor, contact sensor and complete plug set for DH module

Delivery
• District heating transfer station, fully cased and ready for electrical connection.
• Delivered in separate packaging:
- temperature sensor set for TopTronic® E

TransTherm giro (H0/N10-H0/N80)



TransTherm giro Type	Hydraulics	Number of plates (heat exchanger)	Max. flow temperature	nominal pressure	Heat output	Part No.
			°C	bar	kW	
(H0/N10/T110/P16)	0	10	110	16 [1]	26	8006 418
(H0/N10/T140/P16)	0	10	140	16	26	8006 419
(H0/N10/T150/P25)	0	10	150	25	26	8006 420
(H0/N20/T110/P16)	0	20	110	16 [1]	64	8006 422
(H0/N20/T140/P16)	0	20	140	16	64	8006 423
(H0/N20/T150/P25)	0	20	150	25	64	8006 424
(H0/N40/T110/P16)	0	40	110	16 [1]	128	8006 426
(H0/N40/T140/P16)	0	40	140	16	128	8006 427
(H0/N40/T150/P25)	0	40	150	25	128	8006 428
(H0/N60/T110/P16)	0	60	110	16 [1]	151	8006 430
(H0/N60/T140/P16)	0	60	140	16	151	8006 431
(H0/N60/T150/P25)	0	60	150	25	151	8006 432
(H0/N80/T110/P16)	0	80	110	16 [1]	189	8006 433
(H0/N80/T140/P16)	0	80	140	16	189	8006 434
(H0/N80/T150/P25)	0	80	150	25	189	8006 435

[1] Volume flow controller with motorised valve, actuator without emergency control function

Option

Mixer circuit module built-in (wired up incl. wiring diagram) — 8005 835

Part No.

Accessories	Part No.
Immersion sleeve for heat meter DN 10 (¼″ ext.), 35 mm, ID: 5.2 mm	8004 958
 **Sensor pockets heat. network** ½″, 100 mm for imm. sleeve Price comprises 2 pieces	7012 335
 **Heat meter Sharky 775 (MID-cert.)** Qp1,5 DN15(3/4″ ext.) PN25 110mm 230V M-bus sens. FL/RT: 5.2mm/2m direct	8004 668
 **Heat meter Sharky 775 (MID-cert.)** Qp2,5 DN20(1″ ext.) PN25 130mm 230V M-bus sens. FL/RT: 5.2mm/2m direct	8004 711
 **Ball cock** Shut-off fitting between the heating network and the district heating station (without thermal insulation) Nickel-plated brass Inner thread/screw connection Price includes 2 pcs.	

Size	Operating pressure max. bar	Operating temperature max. °C	
¾″	25	120	7011 481
1″	25	120	7011 482
1¼″	25	120	7013 945

Angle ball valve heat network
2 pcs. ball valve as shut-off fitting between the heating network and the district heating station
(without thermal insulation)
Inner thread/screw connection
Price includes 2 pcs.

Size	Operating pressure max. bar	Operating temperature max. °C	
¾″	25	120	7013 946
1″	25	120	7013 947

Ball cock
Shut-off fitting between the heating network and the district heating station
(without thermal insulation)
Steel
Weld end/female thread
Price includes 2 pcs.

Size	Operating pressure max. bar	Operating temperature max. °C	
¾″	25	140	7011 483
1″	25	140	7011 484
1¼″	25	140	7013 944

Part No.

Ball cock
Shut-off fitting between the district heating station and the secondary side (without thermal insulation)
Nickel-plated brass
Inner/outer thread
Price includes 2 pcs.

Size	Operating pressure max. bar	Operating temperature max. °C	Part No.
1″	16	100	7011 485
1¼″	16	100	7011 486

Pressure gauge 7011 901
0-16 bar, Ø 63 mm
price comprises 2 pieces

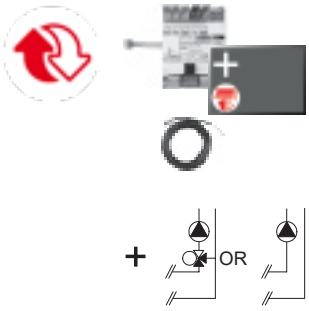
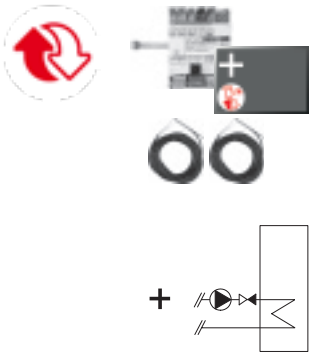
Pressure gauge 7011 902
0-25 bar, Ø 63 mm
price comprises 2 pieces

Twinlock measuring connection 2048 840
for pressure and temperature measurement in the flow and return of the heat network on the district heating station (necessary measuring devices are not included)

Welded screw connections 7011 480
DN 20, PN 25
(2 pcs.)

2 flanges heating network DN 20 PN 25 7010 910

Part No.

	TopTronic® E module expansions for TopTronic® E basic module district heating com	Part No.
	**TopTronic® E module expansion heating circuit district heating TTE-FE HK FW** Expansion to the inputs and outputs of the basic module district heating/fresh water or basic module district heating com for implementing the following functions: - 1 heating/cooling circuit w/o mixer or - 1 heating/cooling circuit with mixer Consisting of: - TopTronic® E module expansion, district heating, - top hat rail with fitting accessories, - ribbon cable for connecting the device bus to the controller module, - connection set for connecting the controller module to the mains voltage, - 1 pce. contact sensor ALF/1.1P/2.5/T, L=2.5 m - complete plug set for module expansions district heating	6038 119
	**TopTronic® E module expansion hot water district heating TTE-FE WW FW** Expansion to the inputs and outputs of the basic module district heating/fresh water or basic module district heating com for implementing a hot water circuit Consisting of: - TopTronic® E module expansion, district heating, - top hat rail with fitting accessories, - ribbon cable for connecting the device bus to the controller module, - connection set for connecting the controller module to the mains voltage, - 2 pcs. immersion sensor TF/1.1P/2.5/6T, L = 2.5 m - complete plug set for module expansions district heating	6038 120
	**TopTronic® E module expansion universal district heating TTE-FE UNI FW** Expansion to the inputs and outputs of a basic module district heating/fresh water or basic module district heating com for implementing various functions. Consisting of: - TopTronic® E module expansion universal district heating - complete plug set for module expansions - top hat rail with fitting accessories - ribbon cable for connecting the device bus to the controller module - connection set for connecting the controller module to the mains voltage - complete plug set for module expansions	6038 117

Notice
Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

Further information
see “Controls” - “Hoval TopTronic® E module expansions district heating” chapter

Part No.

		Part No.
	**Ethernet connection TopTronic® E district heating com** - Communication module expansion for TopTronic® E basic module district heating com - TCP/IP interface for communication with the HovalSupervisor management system - Top hat rail mounting directly adjacent to the basic module - Connection to the basic module via ribbon cable - Dimensions: 46 x 125 x 51 (L x W x H)	2044 995
	**Repeater TopTronic® E district heating com LonBus** - Repeater as electrical signal booster of the LON bus network - Used for increasing the range of the signal when there are long distances between the control centre and the individual Top-Tronic® E basic module district heating com controller modules - Positioning of the repeaters depending on the data network (routing type, cable type, length, etc.) at different points in the network - Electrical power supply 230 VAC - Dimensions: 71 x 92 x 60 (L x W x H) **Notice** After 5 repeaters, a router must be used for boosting the signal. Article on request.	2045 034
	**Router TopTronic® E district heating com - CAN bus** - Interface between the Hoval LONBus network and HovalSupervisor - Interface between the Hoval TCP/IP network and HovalSupervisor - Serves as a physical interface between the data stream of the district heating network and e.g amaster computer with TCP/IP interface - Possibility of connecting differential pressure sensors variable inputs 0 - 10 V or 0/4 - 20 mA - Router can be installed in control panel with DIN-rail mounting - Temp. and pressure control f. up to five strands or 5 heating circuits - Dimensions: 355 x 120 x 75 (L x W x H) TopTronic® E control module black for operating the router (optional) and mating connector set must be ordered separately.	6047 303

Part No.

	Part No.
Data socket TopTronic® E **district heating com** **LonBus and lightning protection** - Data socket for connecting the telecommunication cable at the building connection - Connection must be made according to the appropriate applicable regulations - Data sockets must also be installed with dummy connections - 1x input block 13-pin - 2x output blocks each 13-pin - 2x outputs 3-pin to controller and repeater - Damp room socket IP55, Dimensions: 180 x 140 x 75 (L x W x H), incl. 10-stage nipple	2061 738

■ **Part No.**

HovalConnect available from summer 2019
Up to that point, TopTronic® E online is delivered.

Accessories for TopTronic® E		Part No.
TopTronic® E controller modules		
TTE-HK/WW	TopTronic® E heating circuit/ hot water module	6034 571
TTE-SOL	TopTronic® E solar module	6037 058
TTE-PS	TopTronic® E buffer module	6037 057
TTE-MWA	TopTronic® E measuring module	6034 574
TopTronic® E room control modules		
TTE-RBM	TopTronic® E room control modules	
	easy white	6037 071
	comfort white	6037 069
	comfort black	6037 070
Enhanced language package TopTronic® E one SD card required per control module Consisting of the following languages: HU, CS, SL, RO, PL, TR, ES, HR, SR, JA, DA		6039 253
HovalConnect		
HovalConnect domestic starter LAN		6049 496
HovalConnect domestic starter WLAN		6049 498
HovalConnect commercial starter LAN		6049 495
HovalConnect commercial starter WLAN		6049 497
SMS remote control unit		6018 867
System component SMS remote control unit		6022 797
TopTronic® E interface modules		
GLT module 0-10 V		6034 578
HovalConnect domestic starter Modbus		6049 501
HovalConnect domestic starter KNX		6049 593
HovalConnect commercial starter Modbus		6049 500
HovalConnect commercial starter KNX		6049 502
TopTronic® E wall casing		
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533
TopTronic® E sensors district heating		
AF/1.1P/K	Outdoor sensor	2056 774
TF/1.1P/2.5/6T	Immersion sensor, L = 2.5 m	2056 777
ALF/1.1P/2.5/T	Contact sensor, L = 2.5 m	2056 778
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776
Bivalent switch		2061 826

Further information
see “Controls”

Part No.

	Part No.
Flow temperature controller for underfloor heating systems (1 controller per heating circuit) 15-95 °C, SD 6 K, capillary max. 700 mm. Setting (visible externally) under the casing cover	
Contact thermostat *RAK-TW1000.S* Thermostat with retaining strap, without cable and plug	242 902
Contact thermostat set *RAK-TW1000.S* Thermostat with retaining strap, supplied with cable (4 m) and with plug	6033 745
Immersion thermostat *RAK-TW1000.S SB 150* Thermostat with immersion sleeve ½″ - immersion depth 150 mm, nickel-plated brass	6010 082

Technical data

	District heating primary						Secondary heating			
TransTherm giro	**Max. nominal pressure**	**T-max.**	**Valve**	**Closing pressure [1]**	**Connection size**	**V̇max.**	**Operating pressure**	**T-max.**	**Connection size**	**V̇max.**
Type	bar	°C	kvs	bar	inches	m³/h	bar	°C	inches	m³/h
(H0/N10/T110/P16)	16	110	1.6	4	G 1″	0.9	3	95	Rp 1″	1.3
(H0/N10/T140/P16)	16	140	1.6	14	G 1″	0.9	3	95	Rp 1″	1.3
(H0/N10/T150/P25)	25	150	1.6	20	G 1″	0.9	3	95	Rp 1″	1.3
(H0/N20/T110/P16)	16	110	2.5	4	G 1″	1.2	3	95	Rp 1″	2.4
(H0/N20/T140/P16)	16	140	2.5	14	G 1″	1.6	3	95	Rp 1″	2.4
(H0/N20/T150/P25)	25	150	2.5	20	G 1″	1.6	3	95	Rp 1″	2.4
(H0/N40/T110/P16)	16	110	4.0	14	G 1″	2.4	3	95	Rp 1″	4.5
(H0/N40/T140/P16)	16	140	4.0	14	G 1″	2.4	3	95	Rp 1″	4.5
(H0/N40/T150/P25)	25	150	4.0	20	G 1″	2.4	3	95	Rp 1″	4.5
(H0/N60/T110/P16)	16	110	6.3	14	G 1″	3.5	3	95	Rp 1″	6.5
(H0/N60/T140/P16)	16	140	6.3	14	G 1″	3.5	3	95	Rp 1″	6.5
(H0/N60/T150/P25)	25	150	6.3	20	G 1″	3.5	3	95	Rp 1″	6.5
(H0/N80/T110/P16)	16	110	8.0	14	G 1″	4.5	3	95	Rp 1″	6.5
(H0/N80/T140/P16)	16	140	8.0	14	G 1″	4.5	3	95	Rp 1″	6.5
(H0/N80/T150/P25)	25	150	8.0	20	G 1″	4.5	3	95	Rp 1″	6.5

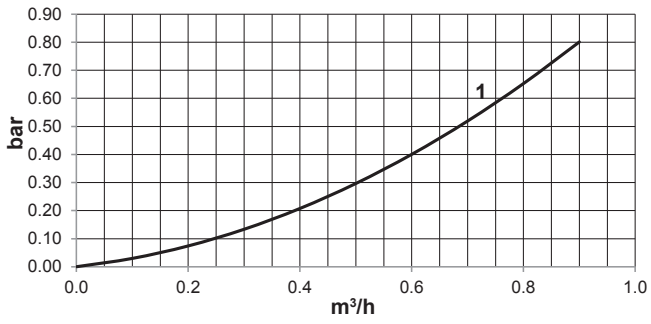
[1] Actuator valve

Technical data

Pressure drop diagrams

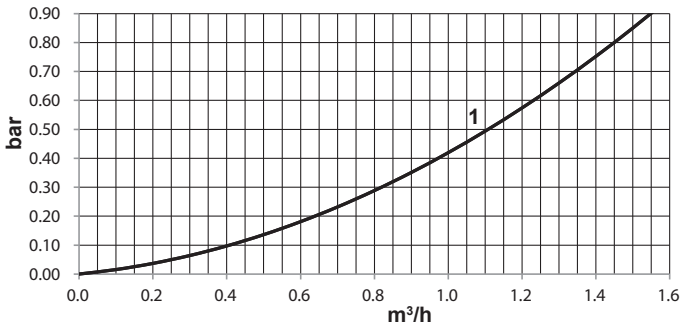
District heating primary
dp control valve with heat exchanger,
without heat meter.

TransTherm giro (H0/N10)



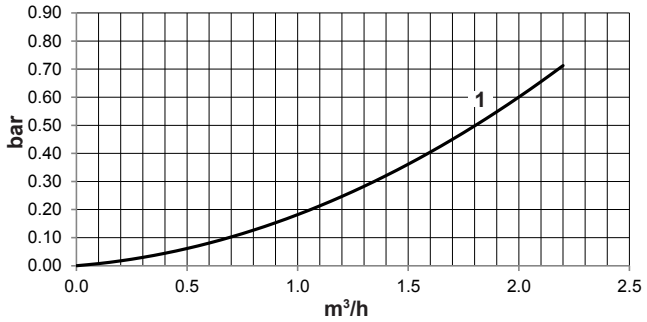
1 kvs 1.6 AVQM DN 15 PN 16(25) 150 °C ¾″

TransTherm giro (H0/N20)



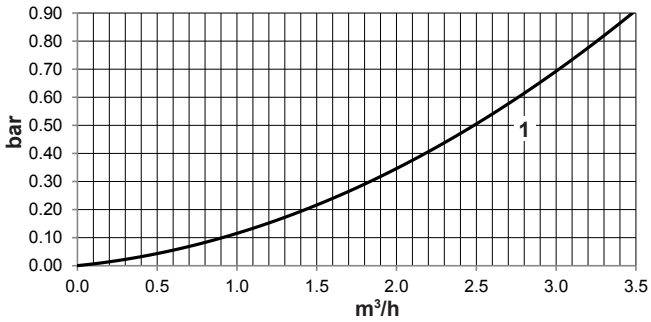
1 kvs 2.5 AVQM DN 15 PN 16(25) 150 °C ¾″

TransTherm giro (H0/N40)



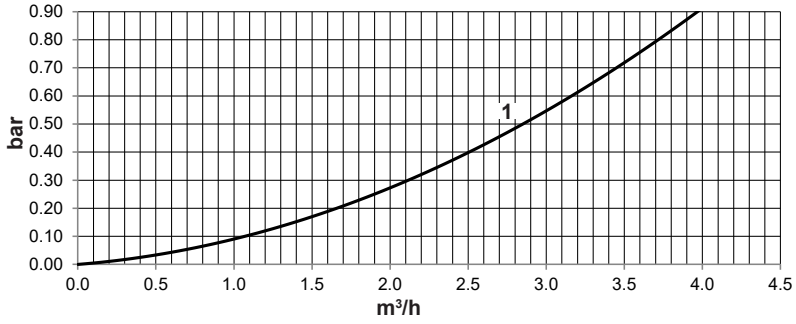
1 kvs 4.0 AVQM DN 15 PN 16(25) 150 °C ¾″

TransTherm giro (H0/N60)



1 kvs 6.3 AVQM DN 20 PN 16(25) 150 °C 1″

TransTherm giro (H0/N80)



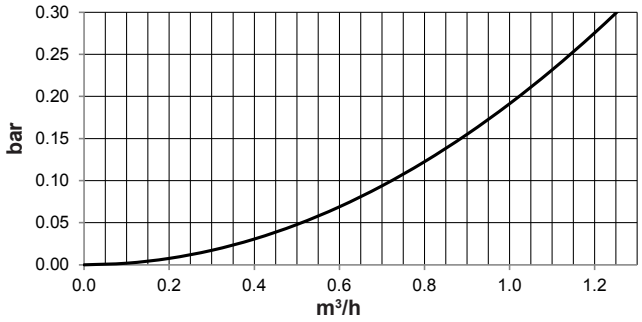
1 kvs 8.0 AVQM DN 20 PN 16(25) 150 °C 1″

Technical data

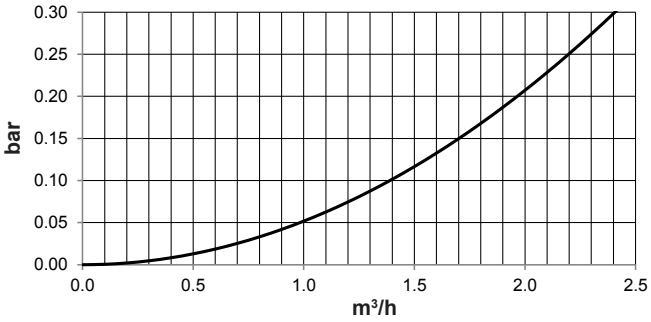
Pressure drop diagrams

Secondary building system
dp heat exchanger

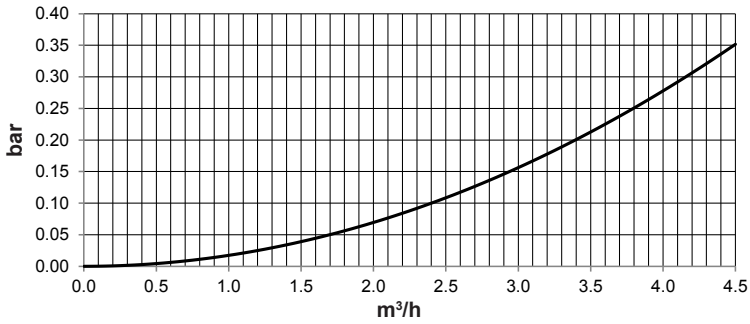
TransTherm giro (H0/N10)



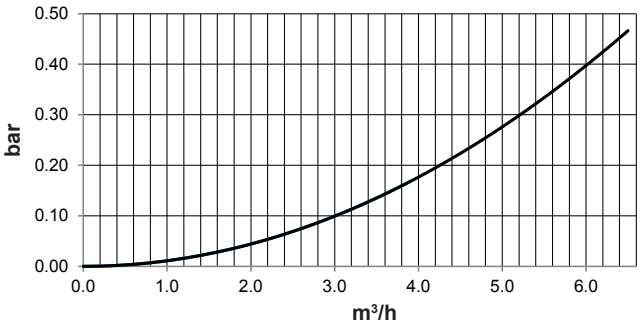
TransTherm giro (H0/N20)



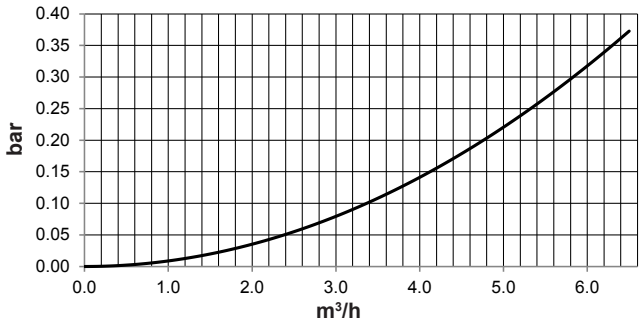
TransTherm giro (H0/N40)



TransTherm giro (H0/N60)



TransTherm giro (H0/N80)



Technical data

Performance data

Hoval TransTherm giro (H0/N10-H0/N80)

- 2 outputs for house system
- Integrated control
  primary: max. return temperature control
  secondary: for 1 mixer circuit, 1 heating circuit without mixer, 1 DHW loading circuit

			District heating									
			70 °C					75 °C				
Secondary heating	**TransTherm giro**		**H0/N10**	**H0/N20**	**H0/N40**	**H0/N60**	**H0/N80**	**H0/N10**	**H0/N20**	**H0/N40**	**H0/N60**	**H0/N80**
75/50 °C	T return primary	°C	-	-	-	-	-	-	-	-	-	-
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	-	-
	Q max.	kW	-	-	-	-	-	-	-	-	-	-
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	-	-
70/50 °C	T return primary	°C	-	-	-	-	-	55	55	55	55	55
	V̇ primary	**m³/h**	-	-	-	-	-	**0.77**	**1.60**	**2.40**	**3.50**	4.50
	Q max.	kW	-	-	-	-	-	18	37	56	81	105
	V̇ secondary	**m³/h**	-	-	-	-	-	**0.77**	**1.60**	**2.40**	**3.50**	4.50
70/55 °C	T return primary	°C	-	-	-	-	-	60	60	60	60	60
	V̇ primary	**m³/h**	-	-	-	-	-	**0.92**	**1.60**	**2.40**	**3.50**	**4.50**
	Q max.	kW	-	-	-	-	-	16	28	42	61	79
	V̇ secondary	**m³/h**	-	-	-	-	-	**0.92**	**1.60**	**2.40**	**3.50**	**4.50**
65/40 °C	T return primary	°C	45	45	45	45	45	43	43	43	43	43
	V̇ primary	**m³/h**	**0.34**	**0.89**	**2.13**	**3.30**	**4.47**	**0.32**	**0.86**	**1.94**	**3.01**	**4.09**
	Q max.	kW	10	26	62	96	130	12	32	72	112	152
	V̇ secondary	**m³/h**	**0.34**	**0.89**	**2.13**	**3.30**	**4.47**	**0.41**	**1.10**	**2.48**	**3.85**	**5.23**
60/40 °C	T return primary	°C	43	43	43	43	43	43	43	43	43	43
	V̇ primary	**m³/h**	**0.57**	**1.40**	**2.40**	**3.50**	**4.50**	**0.70**	**1.45**	**2.40**	**3.50**	**4.06**
	Q max.	kW	18	44	75	110	141	26	54	89	130	151
	V̇ secondary	**m³/h**	**0.77**	**1.89**	**3.24**	**4.73**	**6.08**	**1.12**	**2.32**	**3.84**	**5.60**	**6.50**
60/45 °C	T return primary	°C	47	47	47	47	47	47	47	47	47	47
	V̇ primary	**m³/h**	**0.67**	**1.50**	**2.40**	**3.50**	**4.50**	**0.61**	**1.23**	**2.33**	**3.19**	**3.48**
	Q max.	kW	18	40	64	94	113	20	40	76	104	113
	V̇ secondary	**m³/h**	**1.03**	**2.29**	**3.68**	**5.37**	**6.50**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**
55/30 °C	T return primary	°C	33	33	33	33	33	33	33	33	33	33
	V̇ primary	**m³/h**	**0.42**	**1.07**	**2.42**	**3.50**	**4.50**	**0.57**	**1.35**	**2.40**	**3.52**	**3.87**
	Q max.	kW	18	46	104	151	189	28	66	117	172	189
	V̇ secondary	**m³/h**	**0.62**	**1.58**	**3.58**	**5.18**	**6.50**	**0.96**	**2.27**	**4.03**	**5.92**	**6.50**
50/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32	32
	V̇ primary	**m³/h**	**0.54**	**1.18**	**2.26**	**3.03**	**3.42**	**0.52**	**1.04**	**2.00**	**2.72**	**3.02**
	Q max.	kW	24	52	100	134	151	26	52	100	136	151
	V̇ secondary	**m³/h**	**1.03**	**2.24**	**4.30**	**5.76**	**6.50**	**1.12**	**2.24**	**4.30**	**5.85**	**6.50**
50/35 °C	T return primary	°C	36	36	36	36	36	36	36	36	36	36
	V̇ primary	**m³/h**	**0.51**	**1.01**	**1.87**	**2.58**	**2.87**	**0.44**	**0.88**	**1.63**	**2.25**	**2.50**
	Q max.	kW	20	40	74	102	113	20	40	74	102	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**
45/30 °C	T return primary	°C	31	31	31	31	31	31	31	31	31	31
	V̇ primary	**m³/h**	**0.44**	**0.88**	**1.63**	**2.25**	**2.50**	**0.39**	**0.78**	**1.45**	**1.99**	**2.22**
	Q max.	kW	20	40	74	102	113	20	40	74	102	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**
45/35 °C	T return primary	°C	36	36	36	36	36	36	36	36	36	36
	V̇ primary	**m³/h**	**0.30**	**0.66**	**1.26**	**1.72**	**1.91**	**0.26**	**0.57**	**1.10**	**1.50**	**1.67**
	Q max.	kW	12	26	50	68	76	12	26	50	68	76
	V̇ secondary	**m³/h**	**1.03**	**2.24**	**4.30**	**5.85**	**6.50**	**1.03**	**2.24**	**4.30**	**5.85**	**6.50**

Technical data

Performance data

Hoval TransTherm giro (H0/N10-H0/N80)

- 2 outputs for house system
- Integrated control
  primary: max. return temperature control
  secondary: for 1 mixer circuit, 1 heating circuit without mixer, 1 DHW loading circuit

			District heating									
			80 °C					90 °C				
Secondary heating	**TransTherm giro**		**H0/N10**	**H0/N20**	**H0/N40**	**H0/N60**	**H0/N80**	**H0/N10**	**H0/N20**	**H0/N40**	**H0/N60**	**H0/N80**
75/50 °C	T return primary	°C	55	55	55	55	55	53	53	53	53	53
	V̇ primary	**m³/h**	**0.41**	**1.10**	**2.41**	**3.50**	**4.50**	**0.60**	**1.49**	**2.98**	**3.50**	**4.50**
	Q max.	kW	12	32	70	102	131	26	64	128	151	189
	V̇ secondary	**m³/h**	**0.41**	**1.10**	**2.41**	**3.50**	**4.50**	**0.89**	**2.20**	**4.40**	**5.18**	**6.50**
70/50 °C	T return primary	°C	53	53	53	53	53	52	52	52	52	52
	V̇ primary	**m³/h**	**0.64**	**1.66**	**2.40**	**3.50**	**4.50**	**0.63**	**1.22**	**2.31**	**3.50**	**3.50**
	Q max.	kW	20	52	75	110	141	28	54	102	151	151
	V̇ secondary	**m³/h**	**0.86**	**2.24**	**3.24**	**4.73**	**6.08**	**1.20**	**2.32**	**4.39**	**6.50**	**6.50**
70/55 °C	T return primary	°C	58	58	58	58	58	57	57	57	57	57
	V̇ primary	**m³/h**	**0.78**	**1.56**	**2.97**	**3.50**	**4.50**	**0.52**	**1.04**	**1.98**	**2.71**	**2.96**
	Q max.	kW	20	40	76	90	113	20	40	76	104	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.36**	**5.13**	**6.50**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**
65/40 °C	T return primary	°C	42	42	42	42	42	42	42	42	42	42
	V̇ primary	**m³/h**	**0.32**	**0.81**	**1.77**	**2.76**	**4.28**	**0.61**	**1.22**	**2.26**	**3.12**	**3.39**
	Q max.	kW	14	36	78	122	189	34	68	126	174	189
	V̇ secondary	**m³/h**	**0.48**	**1.24**	**2.68**	**4.20**	**6.50**	**1.17**	**2.34**	**4.33**	**5.99**	**6.50**
60/40 °C	T return primary	°C	42	42	42	42	42	42	42	42	42	42
	V̇ primary	**m³/h**	**0.59**	**1.22**	**2.26**	**3.12**	**3.42**	**0.47**	**0.97**	**1.79**	**2.47**	**2.71**
	Q max.	kW	26	54	100	138	151	26	54	100	138	151
	V̇ secondary	**m³/h**	**1.12**	**2.32**	**4.30**	**5.93**	**6.50**	**1.12**	**2.32**	**4.30**	**5.93**	**6.50**
60/45 °C	T return primary	°C	47	47	47	47	47	47	47	47	47	47
	V̇ primary	**m³/h**	**0.52**	**1.04**	**1.98**	**2.71**	**2.96**	**0.40**	**0.80**	**1.52**	**2.08**	**2.27**
	Q max.	kW	20	40	76	104	113	20	40	76	104	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**
55/30 °C	T return primary	°C	33	33	33	33	33	32	32	32	32	32
	V̇ primary	**m³/h**	**0.62**	**1.21**	**2.27**	**3.15**	**3.46**	**0.50**	**0.98**	**1.84**	**2.55**	**2.80**
	Q max.	kW	34	66	124	172	189	34	66	124	172	189
	V̇ secondary	**m³/h**	**1.17**	**2.27**	**4.27**	**5.92**	**6.50**	**1.17**	**2.27**	**4.27**	**5.92**	**6.50**
50/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32	32
	V̇ primary	**m³/h**	**0.47**	**0.93**	**1.79**	**2.44**	**2.71**	**0.39**	**0.77**	**1.48**	**2.02**	**2.24**
	Q max.	kW	26	52	100	136	151	26	52	100	136	151
	V̇ secondary	**m³/h**	**1.12**	**2.24**	**4.30**	**5.85**	**6.50**	**1.12**	**2.24**	**4.30**	**5.85**	**6.50**
50/35 °C	T return primary	°C	36	36	36	36	36	36	36	36	36	36
	V̇ primary	**m³/h**	**0.39**	**0.78**	**1.45**	**1.99**	**2.22**	**0.32**	**0.64**	**1.18**	**1.62**	**1.81**
	Q max.	kW	20	40	74	102	113	20	40	74	102	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**
45/30 °C	T return primary	°C	31	31	31	31	31	31	31	31	31	31
	V̇ primary	**m³/h**	**0.35**	**0.70**	**1.30**	**1.79**	**1.99**	**0.29**	**0.58**	**1.08**	**1.49**	**1.65**
	Q max.	kW	20	40	74	102	113	20	40	74	102	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**
45/35 °C	T return primary	°C	36	36	36	36	36	36	36	36	36	36
	V̇ primary	**m³/h**	**0.23**	**0.51**	**0.98**	**1.33**	**1.48**	**0.19**	**0.41**	**0.80**	**1.08**	**1.20**
	Q max.	kW	12	26	50	68	76	12	26	50	68	76
	V̇ secondary	**m³/h**	**1.03**	**2.24**	**4.30**	**5.85**	**6.50**	**1.03**	**2.24**	**4.30**	**5.85**	**6.50**

Technical data

Performance data

Hoval TransTherm giro (H0/N10-H0/N80)

- 2 outputs for house system
- Integrated control
  primary: max. return temperature control
  secondary: for 1 mixer circuit, 1 heating circuit without mixer, 1 DHW loading circuit

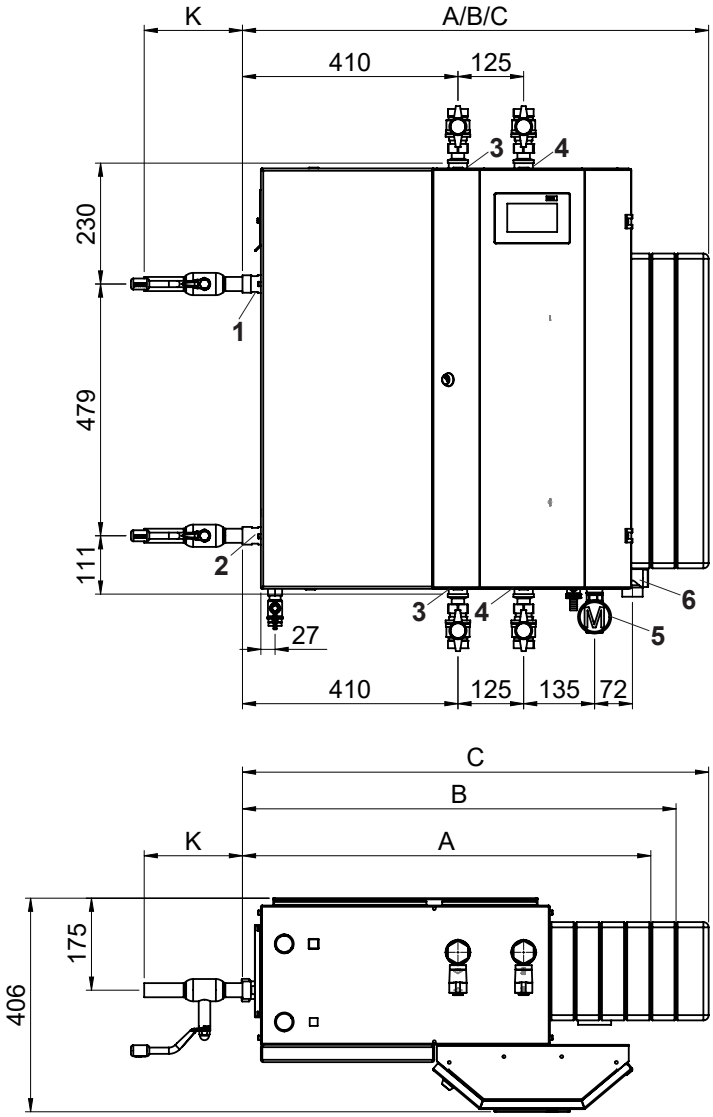
			District heating									
			110 °C					130 °C				
Secondary heating	**TransTherm giro**		**H0/N10**	**H0/N20**	**H0/N40**	**H0/N60**	**H0/N80**	**H0/N10**	**H0/N20**	**H0/N40**	**H0/N60**	**H0/N80**
75/50 °C	T return primary	°C	52	52	52	52	52	52	52	52	52	52
	V̇ primary	**m³/h**	**0.50**	**1.01**	**1.90**	**2.58**	**2.80**	**0.37**	**0.75**	**1.41**	**1.92**	**2.08**
	Q max.	kW	34	68	128	174	189	34	68	128	174	189
	V̇ secondary	**m³/h**	**1.17**	**2.34**	**4.40**	**5.99**	**6.50**	**1.17**	**2.34**	**4.40**	**5.99**	**6.50**
70/50 °C	T return primary	°C	52	52	52	52	52	52	52	52	52	52
	V̇ primary	**m³/h**	**0.42**	**0.80**	**1.51**	**2.24**	**2.24**	**0.31**	**0.60**	**1.12**	**1.67**	**1.67**
	Q max.	kW	28	54	102	151	151	28	54	102	151	151
	V̇ secondary	**m³/h**	**1.20**	**2.32**	**4.39**	**6.50**	**6.50**	**1.20**	**2.32**	**4.39**	**6.50**	**6.50**
70/55 °C	T return primary	°C	57	57	57	57	57	57	57	57	57	57
	V̇ primary	**m³/h**	**0.32**	**0.65**	**1.23**	**1.69**	**1.84**	**0.24**	**0.47**	**0.90**	**1.23**	**1.34**
	Q max.	kW	20	40	76	104	113	20	40	76	104	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**
65/40 °C	T return primary	°C	42	42	42	42	42	42	42	42	42	42
	V̇ primary	**m³/h**	**0.43**	**0.86**	**1.59**	**2.20**	**2.39**	**0.33**	**0.66**	**1.23**	**1.70**	**1.85**
	Q max.	kW	34	68	126	174	189	34	68	126	174	189
	V̇ secondary	**m³/h**	**1.17**	**2.34**	**4.33**	**5.99**	**6.50**	**1.17**	**2.34**	**4.33**	**5.99**	**6.50**
60/40 °C	T return primary	°C	42	42	42	42	42	42	42	42	42	42
	V̇ primary	**m³/h**	**0.33**	**0.68**	**1.26**	**1.75**	**1.91**	**0.25**	**0.53**	**0.98**	**1.35**	**1.48**
	Q max.	kW	26	54	100	138	151	26	54	100	138	151
	V̇ secondary	**m³/h**	**1.12**	**2.32**	**4.30**	**5.93**	**6.50**	**1.12**	**2.32**	**4.30**	**5.93**	**6.50**
60/45 °C	T return primary	°C	47	47	47	47	47	47	47	47	47	47
	V̇ primary	**m³/h**	**0.27**	**0.55**	**1.04**	**1.42**	**1.55**	**0.21**	**0.41**	**0.79**	**1.08**	**1.17**
	Q max.	kW	20	40	76	104	113	20	40	76	104	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**	**1.15**	**2.29**	**4.36**	**5.96**	**6.50**
55/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32	32
	V̇ primary	**m³/h**	**0.37**	**0.73**	**1.37**	**1.90**	**2.08**	**0.30**	**0.58**	**1.09**	**1.51**	**1.66**
	Q max.	kW	34	66	124	172	189	34	66	124	172	189
	V̇ secondary	**m³/h**	**1.17**	**2.27**	**4.27**	**5.92**	**6.50**	**1.17**	**2.27**	**4.27**	**5.92**	**6.50**
50/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32	32
	V̇ primary	**m³/h**	**0.29**	**0.57**	**1.10**	**1.50**	**1.67**	**0.23**	**0.46**	**0.88**	**1.19**	**1.33**
	Q max.	kW	26	52	100	136	151	26	52	100	136	151
	V̇ secondary	**m³/h**	**1.12**	**2.24**	**4.30**	**5.85**	**6.50**	**1.12**	**2.24**	**4.30**	**5.85**	**6.50**
50/35 °C	T return primary	°C	36	36	36	36	36	36	36	36	36	36
	V̇ primary	**m³/h**	**0.23**	**0.46**	**0.86**	**1.19**	**1.32**	**0.18**	**0.37**	**0.68**	**0.93**	**1.04**
	Q max.	kW	20	40	74	102	113	20	40	74	102	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**
45/30 °C	T return primary	°C	31	31	31	31	31	31	31	31	31	31
	V̇ primary	**m³/h**	**0.22**	**0.44**	**0.81**	**1.11**	**1.23**	**0.17**	**0.35**	**0.64**	**0.89**	**0.99**
	Q max.	kW	20	40	74	102	113	20	40	74	102	113
	V̇ secondary	**m³/h**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**	**1.15**	**2.29**	**4.24**	**5.85**	**6.50**
45/35 °C	T return primary	°C	36	36	36	36	37	36	36	36	36	36
	V̇ primary	**m³/h**	**0.14**	**0.30**	**0.58**	**0.79**	**0.89**	**0.11**	**0.24**	**0.46**	**0.62**	**0.69**
	Q max.	kW	12	26	50	68	76	12	26	50	68	76
	V̇ secondary	**m³/h**	**1.03**	**2.24**	**4.30**	**5.85**	**6.50**	**1.03**	**2.24**	**4.30**	**5.85**	**6.50**

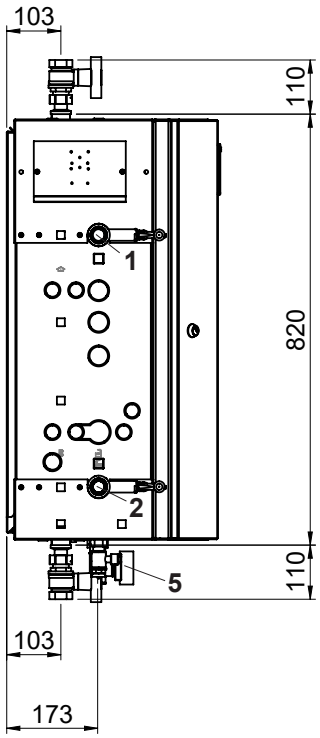
Dimensions

Hoval TransTherm giro (H0/N10-H0/N80)

(Dimensions in mm)

District heating connection on the left - view of exterior





1	VL - primary	R 1″
2	RL - primary	R 1″
3	VL - secondary	Rp 1″
4	RL - secondary	Rp 1″
5	Connection for expansion tank (ball valves/pressure gauge options)	Rp ½″
6	Safety valve	½″

TransTherm giro Type	**Designation**	**without option (ball valve)** mm
(H0/N10,H0/N20)	A	791
(H0/N40)	B	839
(H0/N60,H0/N80)	C	887

Ball valve option	**Size**	**Connection size**	**K** mm
	DN 20	¾″	85
	DN 25	1″	110
	DN 32	1¼″	115
	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

Adapters for heat meter:

PN 16

(H0/N10,H0/N20)	R ¾″, 110 mm
(H0/N40,H0/N60)	R 1″, 130 mm
(H0/N80)	R 1¼″, 260 mm

PN 25

(H0/N10-H0/N60)	R 1″, 190 mm
(H0/N80)	R 1¼″, 260 mm

Sensor dimensions

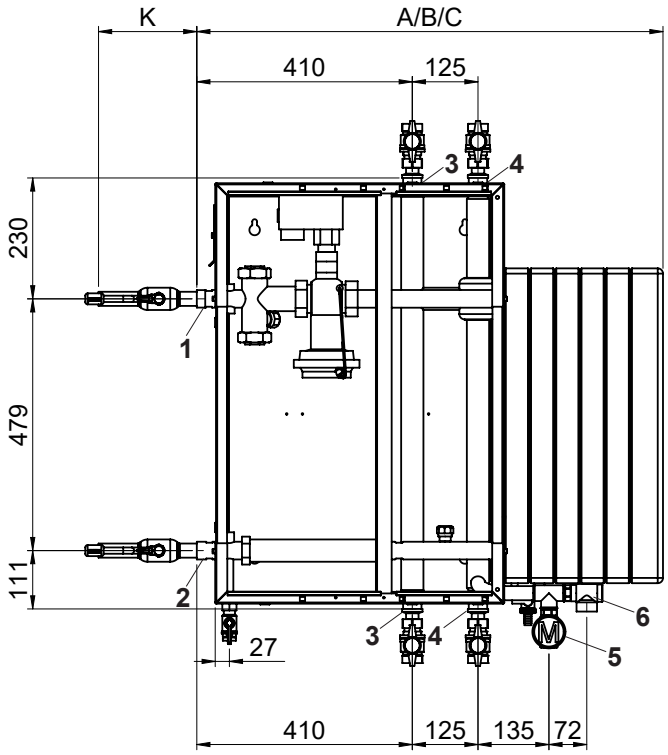
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

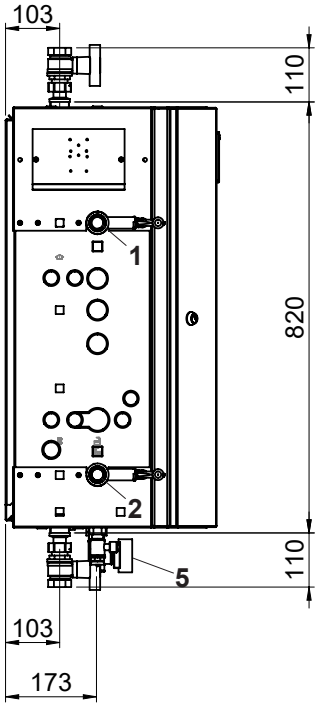
Dimensions

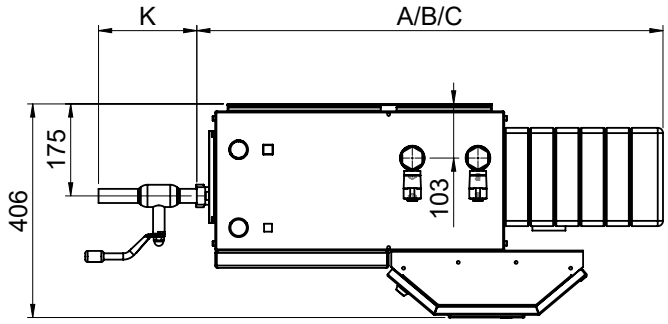
Hoval TransTherm giro (H0/N10-H0/N80)

(Dimensions in mm)

District heating connection on the left - view of interior







TransTherm giro Type	Designation	without option (ball valve) mm
(H0/N10,H0/N20)	A	791
(H0/N40)	B	839
(H0/N60,H0/N80)	C	887

Ball valve option	Size	Connection size	K mm
	DN 20	¾″	85
	DN 25	1″	110
	DN 32	1¼″	115
	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

1	VL - primary	R 1″
2	RL - primary	R 1″
3	VL - secondary	Rp 1″
4	RL - secondary	Rp 1″
5	Connection for expansion tank (ball valves/pressure gauge options)	Rp ½″
6	Safety valve	½″

Adapters for heat meter:

PN 16

(H0/N10,H0/N20)	R ¾″, 110 mm
(H0/N40,H0/N60)	R 1″, 130 mm
(H0/N80)	R 1¼″, 260 mm

PN 25

(H0/N10-H0/N60)	R 1″, 190 mm
(H0/N80)	R 1¼″, 260 mm

Sensor dimensions

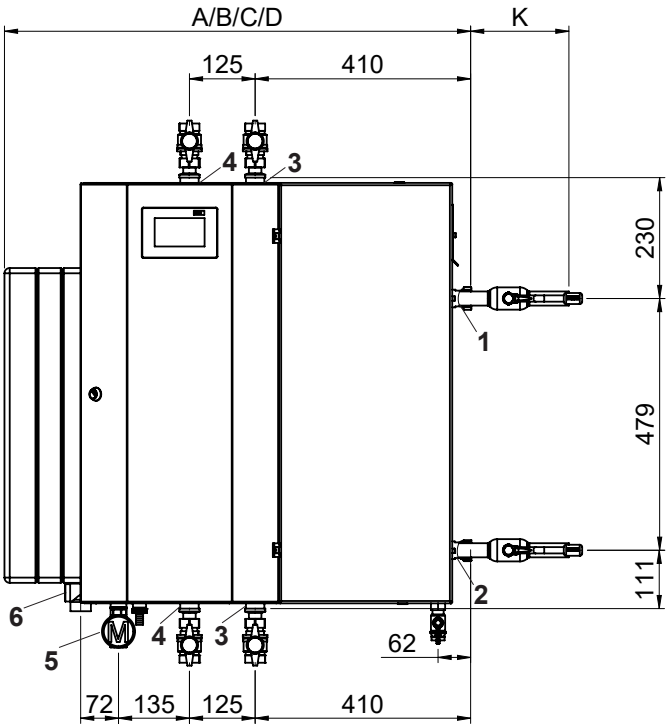
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

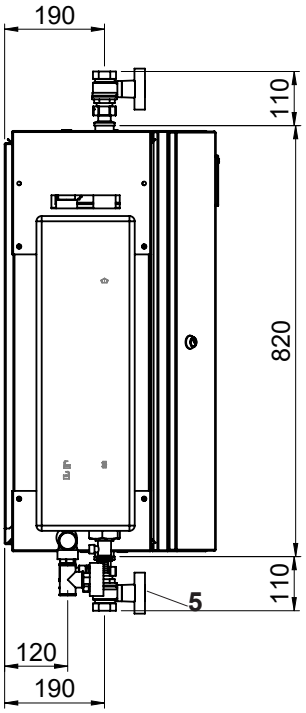
Dimensions

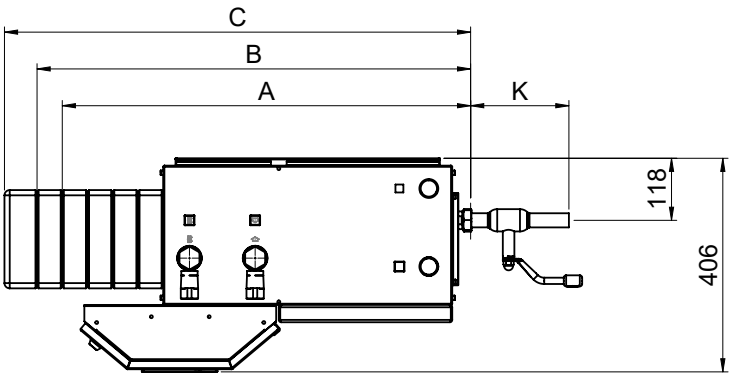
Hoval TransTherm giro (H0/N10-H0/N80)

(Dimensions in mm)

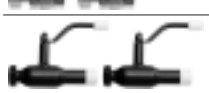
District heating connection on the right - view of exterior
For this connection type, the casing must be turned through 180° on site.







TransTherm giro Type	Designation	without option (ball valve) mm
(H0/N10,H0/N20)	A	791
(H0/N40)	B	839
(H0/N60,H0/N80)	C	887

Ball valve option	Size	Connection size	K mm
	DN 20	¾″	85
	DN 25	1″	110
	DN 32	1¼″	115
	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

1	VL - primary	R 1″
2	RL - primary	R 1″
3	VL - secondary	Rp 1″
4	RL - secondary	Rp 1″
5	Connection for expansion tank (ball valves/pressure gauge options)	Rp ½″
6	Safety valve	½″

Adapters for heat meter:

PN 16

(H0/N10,H0/N20)	R ¾″, 110 mm
(H0/N40,H0/N60)	R 1″, 130 mm
(H0/N80)	R 1¼″, 260 mm

PN 25

(H0/N10-H0/N60)	R 1″, 190 mm
(H0/N80)	R 1¼″, 260 mm

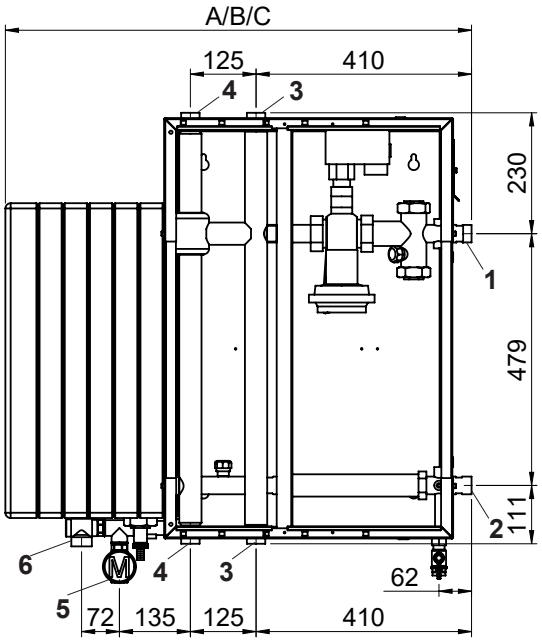
Sensor dimensions
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

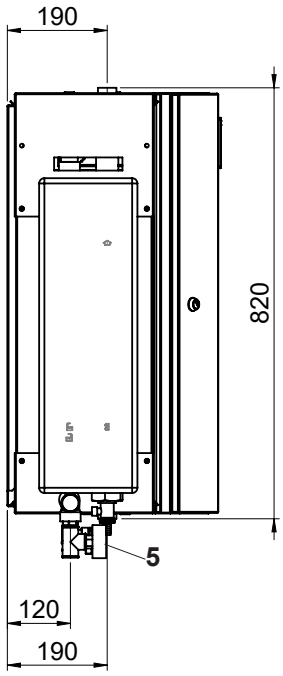
Dimensions

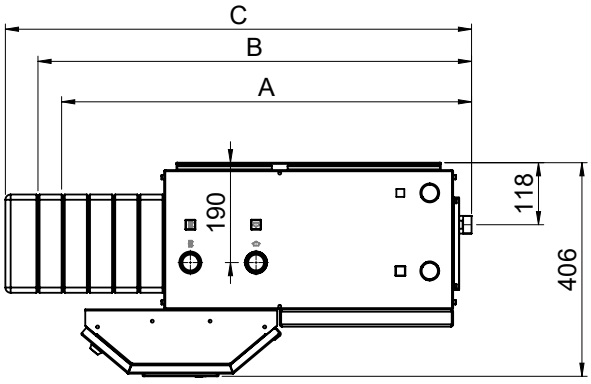
Hoval TransTherm giro (H0/N10-H0/N80)

(Dimensions in mm)

District heating connection on the right - view of interior
For this connection type, the casing must be turned through 180° on site.







TransTherm giro Type	Designation	without option (ball valve) mm
(H0/N10,H0/N20)	A	791
(H0/N40)	B	839
(H0/N60,H0/N80)	C	887

Ball valve option	Size	Connection size	K mm
	DN 20	¾″	85
	DN 25	1″	110
	DN 32	1¼″	115
	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

1	VL - primary	R 1″
2	RL - primary	R 1″
3	VL - secondary	Rp 1″
4	RL - secondary	Rp 1″
5	Connection for expansion tank (ball valves/pressure gauge options)	Rp ½″
6	Safety valve	½″

Adapters for heat meter:

PN 16

(H0/N10,H0/N20)	R ¾″, 110 mm
(H0/N40,H0/N60)	R 1″, 130 mm
(H0/N80)	R 1¼″, 260 mm

PN 25

(H0/N10-H0/N60)	R 1″, 190 mm
(H0/N80)	R 1¼″, 260 mm

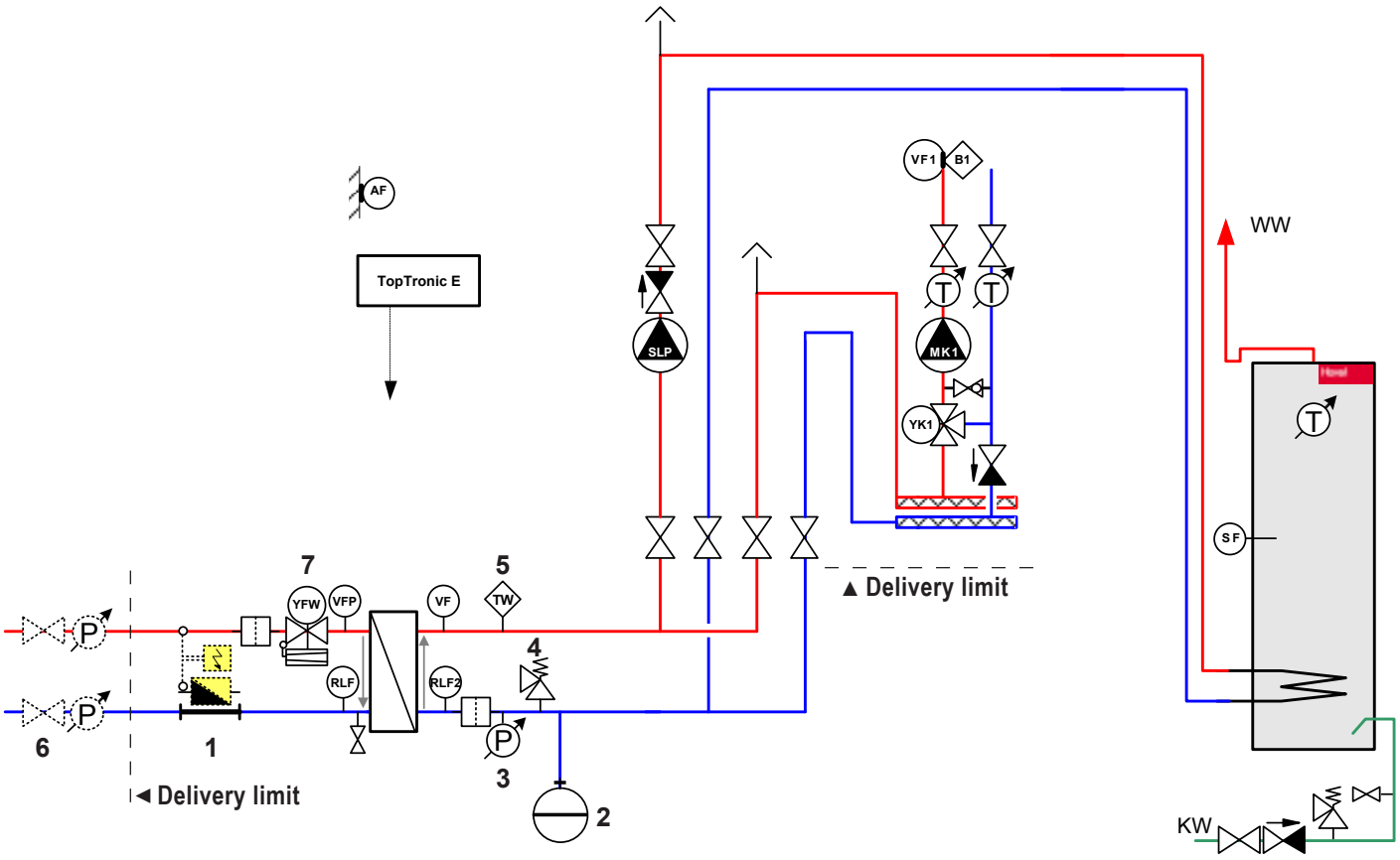
Sensor dimensions
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

Examples

Hoval TransTherm giro (H0/N10-H0/N80)

District heating station with
- 1 heating circuit with mixer
- hot water production

Hydraulic schematic BGAE010



Notice:
- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With underfloor heating a flow temperature monitor must be built in.
- Shut-off devices to the safety valve (pressurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

1 Heat meter adapter (heat meter optional)
2 Pressure expansion tank (option)
3 Pressure gauge
4 Safety valve
5 Temperature monitor
Standard on design
140/150 °C, 16/25 bar
Optional on design
110 °C/16 bar
6 Shut-off valve (option)
7 Volume flow controller with motorised control valve

RLF Return sensor
RLF2 Return sensor (secondary)
VFP Flow sensor (primary)
VF Flow sensor (secondary)
AF Outdoor sensor
SF Calorifier sensor
TW Temperature monitor

Description

Hoval TransTherm giro plus

District heating transfer station
- Indirect compact station for heat transfer and regulation of heating and hot water production systems.
- Standard design for heating water in accordance with DIN and AGFW directives.
  District heating primary:
  - maximum pressure stage 16/25 bar
  - maximum operating temperature 110-150 °C
  - maximum volume flow 2.4 m³/h
  - connections - standard design left, Conversion to the right on site.

  Secondary heating:
  - maximum operating pressure 3 bar
  - maximum operating temperature 95 °C
  - maximum volume flow 3.2 m³/h
  - connection optional, top and/or bottom.

Option
- Special design for other requirements and district-heating-specific requirements on request.

- District heating station in fully welded and thermally insulated design (100 % thermally insulated), in powder-coated sheet aluminium casing, colour pure white (RAL 9010).
- TopTronic® E controller installed

TopTronic® E controller

TopTronic® E control panel
- Colour touchscreen 4.3 inch
- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

TopTronic® E basic module district heating com (TTE-FW com)
Control functions integrated for
- primary valve control
- cascade management
- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- various additional functions
- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Complete plug set for DH module

Options for TopTronic® E controller
- Can be expanded by max. 5 module expansions:
  - module expansion heating circuit DH
  - module expansion hot water DH
  - module expansion universal DH

Series TransTherm giro plus Type	Hydraulics	Number of plates (heat exchanger)	Max. flow temperature °C	nominal pressure bar	Heat output [2] kW
(H../N10/T110/P16)	1/3/5/8/9	10	110	16 [1]	38
(H../N10/T120/P16)	5/9	10	120	16	38
(H../N10/T140/P16)	1/3/8	10	140	16	38
(H../N10/T150/P25)	1/3/8	10	150	25	38
(H../N20/T110/P16)	1/3/8/9	20	110	16 [1]	47
(H9/N20/T120/P16)	9	20	120	16	47
(H../N20/T140/P16)	1/3/8	20	140	16	47
(H../N20/T150/P25)	1/3/8	20	150	25	47
(H../N40/T110/P16)	1/3/8/9	40	110	16 [1]	91
(H9/N40/T120/P16)	9	40	120	16	91
(H../N40/T140/P16)	1/3/8	40	140	16	91
(H../N40/T150/P25)	1/3/8	40	150	25	91

[1] without emergency control function (safety function)

[2] Reference temperature primary 90-53 °C / secondary 75-50 °C

- Can be optionally expanded with various accessories:
  - Ethernet connection TTE-FW com
  - repeater TTE-FW com LON bus
  - router TTE-FW com Ethernet on LON bus
  - data socket 13-pin TTE-FW com LON bus and lighting protection
  - various software licences for HovalSupervisor
  - various services for HovalSupervisor
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module
  - e.g. max 45 mixer circuits

Number of accessories that can be additionally installed in the control panel:
- 1 Ethernet connection TTE-FW com

Further information about the TopTronic® E
see “Controls”

Design on request
- Volume flow controller with motorised valve, actuator with emergency control function
- Supply of system components such as heat meter, heating armature group, calorifier, loading group etc.
- Special design for requirements deviating from the standard or specific requirements for district heating networks.
- Hoval control system
- District heating station for direct heat transmission

Delivery
- District heating transfer station, fully cased and ready for electrical connection
- Adapter for heat meter installation

On site
- Installation of heat meter

Description

TransTherm giro plus (H1/N10-H1/N40)

- Installed:
  District heating primary
  - 1 volume flow controller (with motorised valve, actuator without emergency control function (110 °C) with emergency control function (140, 150 °C)
  - 1 heat meter adapter
  - 1 return temperature sensor
  - 1 strainer
  - 1 drain
  Secondary heating
  - Stainless steel plate heat exchanger in soldered design, 10 plates (H1/N10), 20 plates (H1/N20), 40 plates (H1/N40)
  - 1 flow temperature sensor
  - 1 safety temperature monitor (140,150 °C)
  - 1 safety valve 3 bar
  - 1 pressure gauge
  - 1 strainer
  - 1 drain

1 heating armature group DN 25 for 1 direct heating circuit, comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 1 non-return valve

Spare connection DN 25 for external heating groups

- With air-bleeding/drain, closed

TransTherm giro plus (H3/N10-H3/N40)

- Installed:
  District heating primary
  - 1 volume flow controller (with motorised valve, actuator without emergency control function (110 °C) with emergency control function (140, 150 °C)
  - 1 heat meter adapter
  - 1 return temperature sensor
  - 1 strainer
  - 1 drain
  Secondary heating
  - Stainless steel plate heat exchanger, soldered design, 10 plates (H3/N10), 20 plates (H3/N20), 40 plates (H3/N40)
  - 1 flow temperature sensor
  - 1 safety temperature monitor (140, 150 °C)
  - 1 safety valve 3 bar
  - 1 pressure gauge
  - 1 strainer
  - 1 drain

1 heating armature group DN 25 for 1 direct heating circuit, comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 1 non-return valve

1 calorifier loading group DN 25 comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 1 non-return valve

TransTherm giro plus (H5/N10)

- Installed:
  District heating primary
  - 1 volume flow controller (with motorised valve, actuator without emergency control function (110 °C) with emergency control function (120 °C)
  - 1 heat meter adapter
  - 1 return temperature sensor
  - 1 strainer
  - 1 drain
  Secondary heating
  - Stainless steel heat exchanger in soldered design, 10 plates (H5/N10)
  - 1 flow temperature sensor
  - 1 safety temperature monitor (120 °C)
  - 1 safety valve 3 bar
  - 1 pressure gauge
  - 1 strainer
  - 1 drain

1 heating armature group DN 25 for 1 mixer heating circuit, comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 3-way motor mixer
- 1 non-return valve

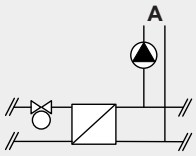
1 heating armature group DN 25 for 1 direct heating circuit, comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 1 non-return valve

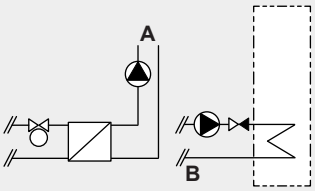
1 calorifier flow group DN 20 Fresh water module comprising

- Volume flow controller and temperature regulator (thermal)
- Stainless steel heat exchanger in soldered design, 36 plates
- 1 pressure expansion valve

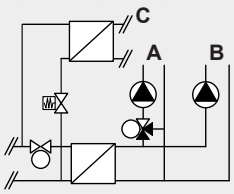
TransTherm giro plus (H1/N10-H1/N40)



TransTherm giro plus (H3/N10-H3/N40)



TransTherm giro plus (H5/N10)



Position connection secondary heating:
A downwards
B upwards
C side

Description

TransTherm giro plus (H8/N10-H8/N40)

- Installed:
  District heating primary
  - 1 volume flow controller (with motorised valve, actuator without emergency control function (110 °C) with emergency control function (120 °C)
  - 1 heat meter adapter
  - 1 return temperature sensor
  - 1 strainer
  - 1 drain

  Secondary heating
  - Stainless steel heat exchanger in soldered design, 10 plates (H8/N10), 20 plates (H8/N20), 40 plates (H8/N40)
  - 1 flow temperature sensor
  - 1 safety temperature monitor (120 °C)
  - 1 safety valve 3 bar
  - 1 pressure gauge
  - 1 strainer
  - 1 drain

1 heating armature group DN 25 for 1 mixer heating circuit, comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 3-way motor mixer
- 1 non-return valve

1 calorifier loading group DN 25 comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 1 non-return valve

TransTherm giro plus (H9/N10-H9/N40)

- Installed:
  District heating primary
  - Volume flow controller (with motorised valve, actuator without emergency control function (110 °C) with emergency control function (120 °C)
  - 1 heat meter adapter
  - 1 return temperature sensor
  - 1 strainer
  - 1 drain

  Secondary heating
  - Stainless steel plate heat exchanger in soldered design, 10 plates (H9/N10), 20 plates (H9/N20), 40 plates (H9/N40)
  - 1 flow temperature sensor
  - 1 safety temperature monitor (120 °C)
  - 1 safety valve 3 bar
  - 1 pressure gauge
  - 1 strainer
  - 1 drain

1 heating armature group DN 25 for 1 direct heating circuit, comprising

- Complete pipework with 2 ball valves
- High-efficiency heating circulating pump
- 1 non-return valve

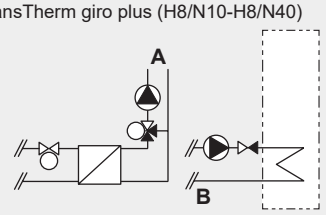
1 calorifier flow group DN 20 Fresh water module, comprising

- Volume flow controller and temperature regulator (thermal)
- Stainless steel heat exchanger in soldered design, 36 plates
- 1 pressure expansion valve

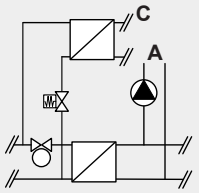
Spare connection DN 25 for external heating groups

- With air-bleeding/drain, closed

TransTherm giro plus (H8/N10-H8/N40)



TransTherm giro plus (H9/N10-H9/N40)



Position connection secondary heating:
A downwards
B upwards
C side

Part No.

Hoval TransTherm giro plus

District heating transfer station Hoval TransTherm giro plus

Part No.

Indirect compact station for heat transfer and control of heating and water heating plants with built in Hoval TopTronic® E control for controller district heating systems in communicative networks (communications interface to the instrumentation and control system) and the associated consumers

Control function integrated for:
- primary valve control
- cascade management
- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- various additional functions

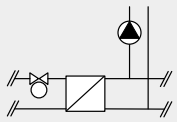
• Can be optionally expanded by max. 5 module expansions:
- module expansion heating circuit DH
- module expansion hot water DH
- module expansion universal DH

• Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Incl. outdoor sensor, immersion sensor, contact sensor and complete plug set for DH module

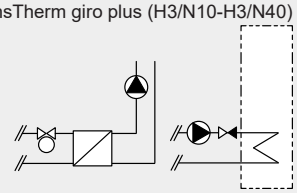
Installed:

TransTherm giro plus (H1/N10-H1/N40)



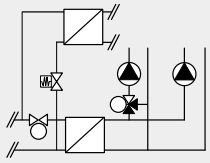
TransTherm giro plus (H1/N10-H1/N40)
- 1 heating group without mixer DN 25
- Spare connection DN 25 for external heating group

TransTherm giro plus (H3/N10-H3/N40)



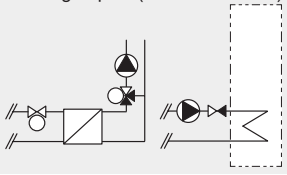
TransTherm giro plus (H3/N10-H3/N40)
- 1 heating group without mixer DN 25
- 1 calorifier loading group DN 25

TransTherm giro plus (H5/N10)



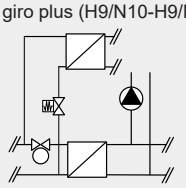
TransTherm giro plus (H5/N10)
- 1 heating group with mixer DN 25
- 1 heating group without mixer DN 25
- 1 calorifier flow group DN 20 Fresh water module

TransTherm giro plus (H8/N10-H8/N40)



TransTherm giro plus (H8/N10-H8/N40)
- 1 heating group with mixer DN 25
- 1 calorifier loading group DN 25

TransTherm giro plus (H9/N10-H9/N40)

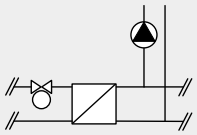


TransTherm giro plus (H9/N10-H9/N40)
- 1 heating group without mixer DN 25
- 1 calorifier flow group DN 20 Fresh water module
- Spare connection DN 25 for external heating group

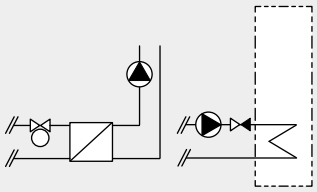
Delivery
• District heating transfer station, fully cased and wired ready for electrical connection

Part No.

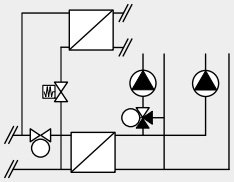
TransTherm giro plus (H1/N10-H1/N40)



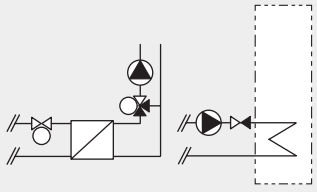
TransTherm giro plus (H3/N10-H3/N40)



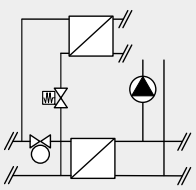
TransTherm giro plus (H5/N10)



TransTherm giro plus (H8/N10-H8/N40)



TransTherm giro plus (H9/N10-H9/N40)



District heating transfer station Hoval TransTherm giro plus						Part No.
TransTherm giro plus Type	Hydraulics	Number of plates (heat exchanger)	Max. flow temperature °C	nominal pressure bar	Heat output kW	
(H1/N10/T110/P16)	1	10	110	16 [1)]	38	8006 439
(H1/N10/T140/P16)	1	10	140	16	38	8006 440
(H1/N10/T150/P25)	1	10	150	25	38	8006 441
(H1/N20/T110/P16)	1	20	110	16 [1)]	47	8006 442
(H1/N20/T140/P16)	1	20	140	16	47	8006 443
(H1/N20/T150/P25)	1	20	150	25	47	8006 444
(H1/N40/T110/P16)	1	40	110	16 [1)]	91	8006 445
(H1/N40/T140/P16)	1	40	140	16	91	8006 446
(H1/N40/T150/P25)	1	40	150	25	91	8006 447
(H3/N10/T110/P16)	3	10	110	16 [1)]	38	8006 451
(H3/N10/T140/P16)	3	10	140	16	38	8006 452
(H3/N10/T150/P25)	3	10	150	25	38	8006 453
(H3/N20/T110/P16)	3	20	110	16 [1)]	47	8006 454
(H3/N20/T140/P16)	3	20	140	16	47	8006 455
(H3/N20/T150/P25)	3	20	150	25	47	8006 456
(H3/N40/T110/P16)	3	40	110	16 [1)]	91	8006 457
(H3/N40/T140/P16)	3	40	140	16	91	8006 458
(H3/N40/T150/P25)	3	40	150	25	91	8006 459
(H5/N10/T110/P16)	5	10	110	16 [1)]	38	8006 463
(H5/N10/T120/P16)	5	10	120	16	38	8006 464
(H8/N10/T110/P16)	8	10	110	16 [1)]	38	8006 397
(H8/N10/T140/P16)	8	10	140	16	38	8006 398
(H8/N10/T150/P25)	8	10	150	25	38	8006 399
(H8/N20/T110/P16)	8	20	110	16 [1)]	47	8006 400
(H8/N20/T140/P16)	8	20	140	16	47	8006 401
(H8/N20/T150/P25)	8	20	150	25	47	8006 402
(H8/N40/T110/P16)	8	40	110	16 [1)]	91	8006 403
(H8/N40/T140/P16)	8	40	140	16	91	8006 404
(H8/N40/T150/P25)	8	40	150	25	91	8006 405
(H9/N10/T110/P16)	9	10	110	16 [1)]	38	8006 409
(H9/N10/T120/P16)	9	10	120	16	38	8006 410
(H9/N20/T110/P16)	9	20	110	16 [1)]	47	8006 411
(H9/N20/T120/P16)	9	20	120	16	47	8006 412
(H9/N40/T110/P16)	9	40	110	16 [1)]	91	8006 413
(H9/N40/T120/P16)	9	40	120	16	91	8006 414

[1] Volume flow controller with motorised valve, actuator without emergency control function

■ **Part No.**

	Accessories	Part No.
	Immersion sleeve for heat meter DN 10 (¼″ ext.), 35 mm, ID: 5.2 mm	8004 958
	**Sensor pockets heat. network** ½″, 100 mm for imm. sleeve Price comprises 2 pieces	7012 335
	**Heat meter Sharky 775 (MID-cert.)** Qp1,5 DN15(3/4″ ext.) PN25 110mm 230V M-bus sens. FL/RT: 5.2mm/2m direct	8004 668
	**Heat meter Sharky 775 (MID-cert.)** Qp2,5 DN20(1″ ext.) PN25 130mm 230V M-bus sens. FL/RT: 5.2mm/2m direct	8004 711

Ball cock
Shut-off fitting between the heating network and the district heating station (without thermal insulation)
Nickel-plated brass
Inner thread/screw connection
Price includes 2 pcs.

Size	Operating pressure max. bar	Operating temperature max. °C	
¾″	25	120	7011 481
1″	25	120	7011 482
1¼″	25	120	7013 945

Angle ball valve heat network
2 pcs. ball valve as shut-off fitting between the heating network and the district heating station (without thermal insulation)
Inner thread/screw connection
Price includes 2 pcs.

Size	Operating pressure max. bar	Operating temperature max. °C	
¾″	25	120	7013 946
1″	25	120	7013 947

Ball cock
Shut-off fitting between the heating network and the district heating station (without thermal insulation)
Steel
Weld end/female thread
Price includes 2 pcs.

Size	Operating pressure max. bar	Operating temperature max. °C	
¾″	25	140	7011 483
1″	25	140	7011 484
1¼″	25	140	7013 944

Part No.

	Part No.
 **Pressure gauge** 0-16 bar, Ø 63 mm price comprises 2 pieces	7011 901
 **Pressure gauge** 0-25 bar, Ø 63 mm price comprises 2 pieces	7011 902
 **Twinlock measuring connection** for pressure and temperature measurement in the flow and return of the heat network on the district heating station (necessary measuring devices are not included)	2048 840
 **Welded screw connections** DN 20, PN 25 (2 pcs.)	7011 480
2 flanges heating network DN 20 PN 25	7010 910
 **Circulation set** for TransTherm giro plus (H5/N10), (H9/N10-H9/N40) for on site installation at cold water inlet of TransTherm giro plus Set consists of: - Recirculation pump w/internal ball valve and non-return valve- Safety valve 10 bar - Required connection elements	7016 730

Part No.

	Accessories for TopTronic® E	Part No.
	**Ethernet connection TopTronic® E district heating com** - Communication module expansion for TopTronic® E basic module district heating com - TCP/IP interface for communication with the HovalSupervisor management system - Top hat rail mounting directly adjacent to the basic module - Connection to the basic module via ribbon cable - Dimensions: 46 x 125 x 51 (L x W x H)	2044 995
	**Repeater TopTronic® E district heating com LonBus** - Repeater as electrical signal booster of the LON bus network - Used for increasing the range of the signal when there are long distances between the control centre and the individual Top-Tronic® E basic module district heating com controller modules - Positioning of the repeaters depending on the data network (routing type, cable type, length, etc.) at different points in the network - Electrical power supply 230 VAC - Dimensions: 71 x 92 x 60 (L x W x H) **Notice** After 5 repeaters, a router must be used for boosting the signal. Article on request.	2045 034
	**Router TopTronic® E district heating com - CAN bus** - Interface between the Hoval LONBus network and HovalSupervisor - Interface between the Hoval TCP/IP network and HovalSupervisor - Serves as a physical interface between the data stream of the district heating network and e.g amaster computer with TCP/IP interface - Possibility of connecting differential pressure sensors variable inputs 0 - 10 V or 0/4 - 20 mA - Router can be installed in control panel with DIN-rail mounting - Temp. and pressure control f. up to five strands or 5 heating circuits - Dimensions: 355 x 120 x 75 (L x W x H) TopTronic® E control module black for operating the router (optional) and mating connector set must be ordered separately.	6047 303

Part No.

	Part No.
 **Data socket TopTronic® E district heating com** **LonBus and lightning protection** - Data socket for connecting the telecommunication cable at the building connection - Connection must be made according to the appropriate applicable regulations - Data sockets must also be installed with dummy connections - 1x input block 13-pin - 2x output blocks each 13-pin - 2x outputs 3-pin to controller and repeater - Damp room socket IP55, Dimensions: 180 x 140 x 75 (L x W x H), incl. 10-stage nipple	2061 738
Flow temperature controller for underfloor heating systems (1 controller per heating circuit) 15-95°C, SD 6K, capillary max. 700 mm. Setting (visible externally) under the casing cover	
 *Contact thermostat RAK-TW1000.S* Thermostat with retaining strap, without cable and plug	242 902
Contact thermostat set RAK-TW1000.S Thermostat with retaining strap, supplied with cable (4 m) and with plug	6033 745
 *Immersion thermostat RAK-TW1000.S SB 150* Thermostat with immersion sleeve 1/2″ - immersion depth 150 mm, nickel-plated brass	6010 082

Technical data

District heating primary

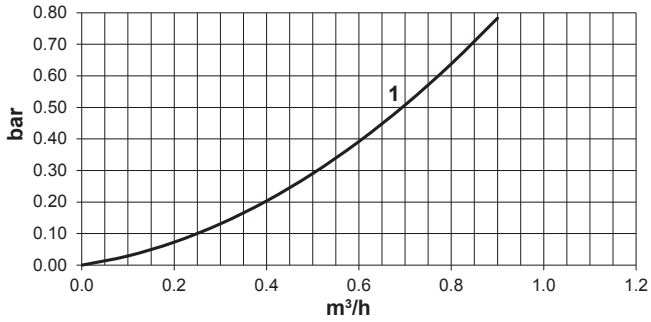
TransTherm giro plus Type	Nominal pressure bar	T-max. °C	Valve kvs	Closing pressure [1] bar	V̇ max. m³/h
(H1/N10/T110/P16)	16	110	1.6	4.0	0.9
(H1/N10/T140/P16)	16	140	1.6	14.0	0.9
(H1/N10/T150/P25)	25	150	1.6	20.0	0.9
(H1/N20/T110/P16)	16	110	2.5	4.0	1.6
(H1/N20/T140/P16)	16	140	2.5	14.0	1.6
(H1/N20/T150/P25)	25	150	2.5	20.0	1.6
(H1/N40/T110/P16)	16	110	4.0	14.0	2.4
(H1/N40/T140/P16)	16	140	4.0	14.0	2.4
(H1/N40/T150/P25)	25	150	4.0	20.0	2.4
(H3/N10/T110/P16)	16	110	1.6	4.0	0.9
(H3/N10/T140/P16)	16	140	1.6	14.0	0.9
(H3/N10/T150/P25)	25	150	1.6	20.0	0.9
(H3/N20/T110/P16)	16	110	2.5	4.0	1.6
(H3/N20/T140/P16)	16	140	2.5	14.0	1.6
(H3/N20/T150/P25)	25	150	2.5	20.0	1.6
(H3/N40/T110/P16)	16	110	4.0	14.0	2.4
(H3/N40/T140/P16)	16	140	4.0	14.0	2.4
(H3/N40/T150/P25)	25	150	4.0	20.0	2.4
(H5/N10/T110/P16)	16	110	1.6	4.0	0.9
(H5/N10/T120/P16)	16	120	1.6	6.0	0.9
(H8/N10/T110/P16)	16	110	1.6	4.0	1.0
(H8/N10/T140/P16)	16	140	2.5	14.0	1.6
(H8/N10/T150/P25)	25	150	2.5	20.0	1.6
(H8/N20/T110/P16)	16	110	2.5	4.0	1.2
(H8/N20/T140/P16)	16	140	2.5	14.0	1.6
(H8/N20/T150/P25)	25	150	2.5	20.0	1.6
(H8/N40/T110/P16)	16	110	4.0	14.0	2.2
(H8/N40/T140/P16)	16	140	4.0	14.0	2.4
(H8/N40/T150/P25)	25	150	4.0	20.0	2.4
(H9/N10/T110/P16)	16	110	1.6	6.0	0.9
(H9/N10/T120/P16)	16	120	1.6	6.0	0.9
(H9/N20/T110/P16)	16	110	2.5	6.0	1.6
(H9/N20/T120/P16)	16	120	2.5	6.0	1.6
(H9/N40/T110/P16)	16	110	4.0	6.0	2.4
(H9/N40/T120/P16)	16	120	4.0	6.0	2.4

[1] Actuator valve

Technical data

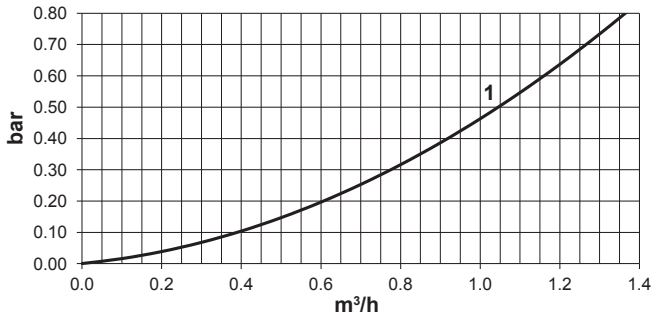
Pressure drop diagrams
District heating primary
dp control valve with heat exchanger,
without heat meter

TransTherm giro plus (H../N10)



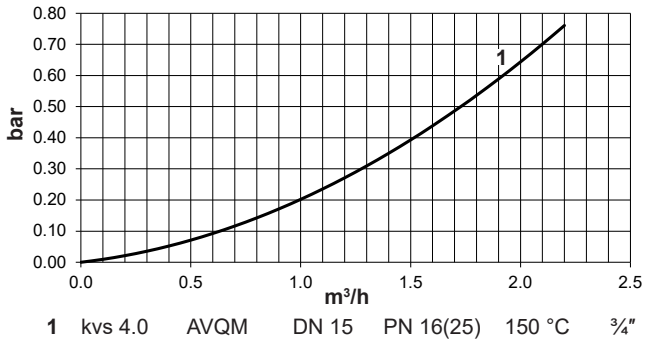
1 kvs 1.6 AVQM DN 15 PN 16(25) 150 °C ¾″

TransTherm giro plus (H../N20)



1 kvs 2.5 AVQM DN 15 PN 16(25) 150 °C ¾″

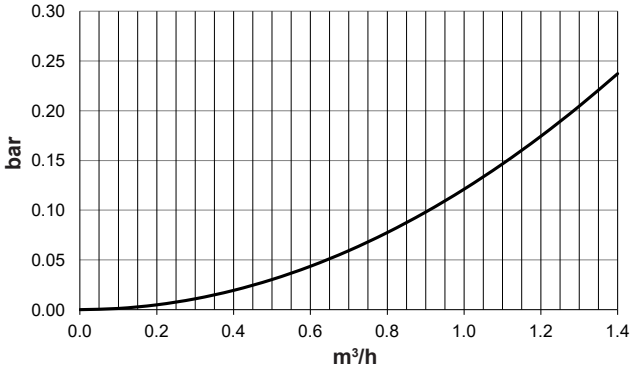
TransTherm giro plus (H../N40)



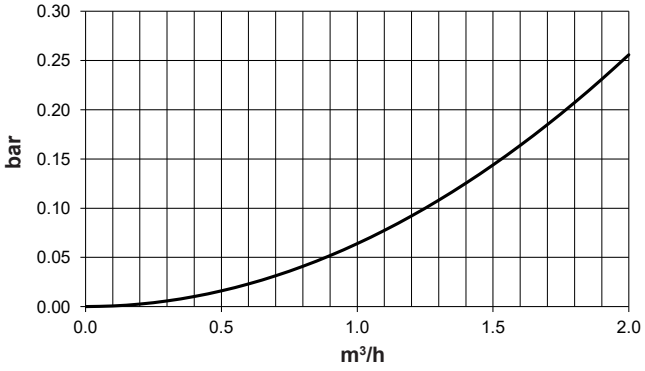
1 kvs 4.0 AVQM DN 15 PN 16(25) 150 °C ¾″

Pressure drop diagrams
Building system secondary
dp heat exchanger

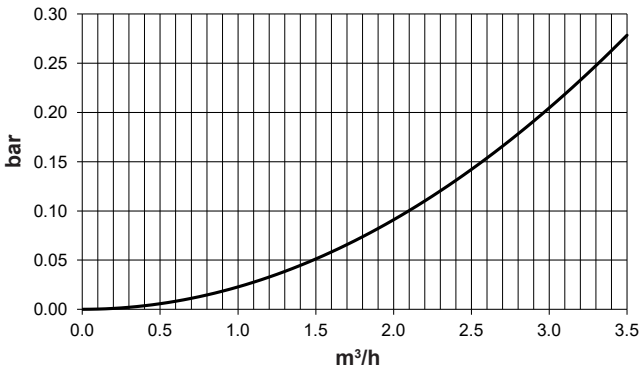
TransTherm giro plus (H../N10)



TransTherm giro plus (H../N20)



TransTherm giro plus (H../N40)



Technical data

Secondary heating TransTherm giro plus	Connection size	Operating pressure 3 bar, T-max. 95 °C Volume flow		
		Mixer circuit	Direct circuit	DHW loading circuit
Type	DN	m³/h	m³/h	m³/h
(H1/N10/T110/P16)	25	-	1.15	-
(H1/N10/T140/P16)	25	-	1.15	-
(H1/N10/T150/P25)	25	-	1.15	-
(H1/N20/T110/P16)	25	-	2.05	-
(H1/N20/T140/P16)	25	-	2.05	-
(H1/N20/T150/P25)	25	-	2.05	-
(H1/N40/T110/P16)	25	-	4.05	-
(H1/N40/T140/P16)	25	-	4.05	-
(H1/N40/T150/P25)	25	-	4.05	-
(H3/N10/T110/P16)	25	-	1.15	1.15
(H3/N10/T140/P16)	25	-	1.15	1.15
(H3/N10/T150/P25)	25	-	1.15	1.15
(H3/N20/T110/P16)	25	-	2.05	1.6
(H3/N20/T140/P16)	25	-	2.05	1.6
(H3/N20/T150/P25)	25	-	2.05	1.6
(H3/N40/T110/P16)	25	-	4.05	1.85
(H3/N40/T140/P16)	25	-	4.05	1.85
(H3/N40/T150/P25)	25	-	4.05	1.85
(H5/N10/T110/P16)	25	1.0	1.15	-
(H5/N10/T120/P16)	25	1.0	1.15	-
(H8/N10/T110/P16)	25	1.0	-	1.15
(H8/N10/T140/P16)	25	1.0	-	1.15
(H8/N10/T150/P25)	25	1.0	-	1.15
(H8/N20/T110/P16)	25	1.65	-	1.6
(H8/N20/T140/P16)	25	1.65	-	1.6
(H8/N20/T150/P25)	25	1.65	-	1.6
(H8/N40/T110/P16)	25	3.6	-	1.85
(H8/N40/T140/P16)	25	3.6	-	1.85
(H8/N40/T150/P25)	25	3.6	-	1.85
(H9/N10/T110/P16)	25	-	1.15	-
(H9/N10/T120/P16)	25	-	1.15	-
(H9/N20/T110/P16)	25	-	2.05	-
(H9/N20/T120/P16)	25	-	2.05	-
(H9/N40/T110/P16)	25	-	4.05	-
(H9/N40/T120/P16)	25	-	4.05	-

Fresh water module type F (7-36)

Maximum pressures/temperatures:

Primary side	PN 16/120 °C
DHW	PN 10
Setting range	45-65 °C

Setpoint in temperature maintenance mode
approx. 8-10 °C under the setpoint

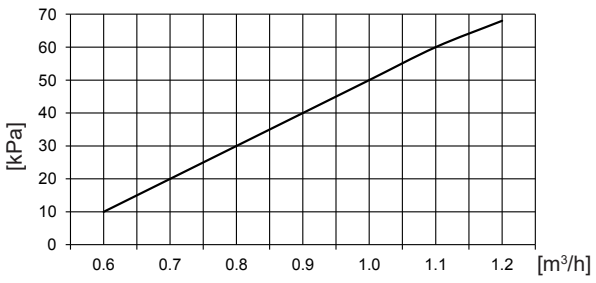
Effective pressure of the integrated differential pressure regulator 16 kPa

Volume flow temperature regulator (thermal) kvs = 3.0

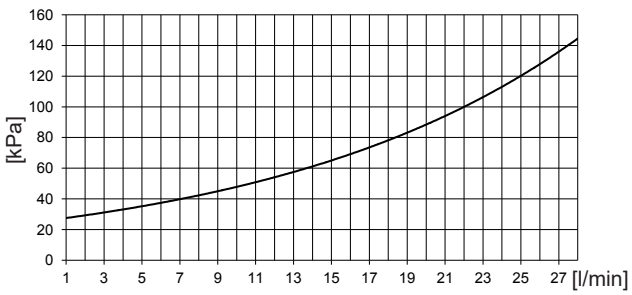
Technical data - DHW side:

Output	35…55 kW
Nominal pressure	10 bar
Maximum pressure	6/8/10 bar
Test pressure	8/12/15 bar
Min. differential pressure	0.8 bar
Max. differential pressure	6 bar
Operating temperature	65…45-10 °C
Maximum temperature	80 °C
Connection dimension	DN 20 3/4″ ext. thread

Pressure drop, district heating side



Pressure drop DHW side



Technical data
Performance data

TransTherm giro plus
Integrated control: primary: max. return temperature control
secondary for heating circuits in acc. with table

TransTherm giro plus Type	Mixer circuit	Direct heating circuit	DHW loading circuit	Fresh water module	Spare connection for external heating circuit
(H1/N10-H1/N40)		●			●
(H3/N10-H3/N40)		●	●		
(H5/N10)	●	●		●	
(H8/N10-H8/N40)	●		●		
(H9/N10-H9/N40)		●		●	●

Secondary heating	**TransTherm giro plus**		**District heating**								
			70 °C			**75 °C**			**80 °C**		
			(H1/N10) (H3/N10) (H5/N10) (H8/N10) (H9/N10)	(H1/N20) (H3/N20) (H8/N20) (H9/N20)	(H1/N40) (H3/N40) (H8/N40) (H9/N40)	(H1/N10) (H3/N10) (H5/N10) (H8/N10) (H9/N10)	(H1/N20) (H3/N20) (H8/N20) (H9/N20)	(H1/N40) (H3/N40) (H8/N40) (H9/N40)	(H1/N10) (H3/N10) (H5/N10) (H8/N10) (H9/N10)	(H1/N20) (H3/N20) (H8/N20) (H9/N20)	(H1/N40) (H3/N40) (H8/N40) (H9/N40)
75/50 °C	T return primary	°C	-	-	-	-	-	-	55	55	55
	V̇primary	**m³/h**	-	-	-	-	-	-	0.56	0.77	1.87
	Q max.	kW	-	-	-	-	-	-	16	22	53
	V̇secondary	**m³/h**	-	-	-	-	-	-	0.56	0.77	1.87
70/50 °C	T return primary	°C	-	-	-	55	55	55	54	53	53
	V̇primary	**m³/h**	-	-	-	1.01	1.41	2.2	0.99	1.2	2.34
	Q max.	kW	-	-	-	23	32	52	30	38	73
	V̇secondary	**m³/h**	-	-	-	1.01	1.39	2.3	1.31	1.66	3.18
70/55 °C	T return primary	°C	-	-	-	59	59	58	57	57	57
	V̇primary	**m³/h**	-	-	-	1.23	1.49	2.2	0.87	1.05	2.04
	Q max.	kW	-	-	-	23	28	43	23	28	55
	V̇secondary	**m³/h**	-	-	-	1.34	1.64	2.56	1.34	1.64	3.21
65/40 °C	T return primary	°C	45	45	45	45	45	44	44	44	43
	V̇primary	**m³/h**	0.53	0.7	1.58	1	1.39	2.2	0.92	1.12	2.14
	Q max.	kW	15	20	45	34	47	77	38	47	91
	V̇secondary	**m³/h**	0.53	0.7	1.58	1.18	1.64	2.71	1.33	1.64	3.18
60/40 °C	T return primary	°C	44	44	43	43	43	42	42	42	42
	V̇primary	**m³/h**	1.01	1.27	2.2	0.81	1.01	1.94	0.69	0.84	1.65
	Q max.	kW	30	38	68	30	38	73	30	38	73
	V̇secondary	**m³/h**	1.31	1.66	2.98	1.31	1.66	3.18	1.31	1.66	3.18
60/45 °C	T return primary	°C	47	47	47	47	47	47	47	47	47
	V̇primary	**m³/h**	0.89	1.01	2.06	0.71	0.86	1.66	0.59	0.72	1.39
	Q max.	kW	23	28	55	23	28	55	23	28	55
	V̇secondary	**m³/h**	1.34	1.63	3.19	1.34	1.63	3.19	1.34	1.63	3.19
55/30 °C	T return primary	°C	34	34	34	33	33	33	33	32	32
	V̇primary	**m³/h**	0.94	1.15	2.19	0.8	0.99	1.88	0.69	0.85	1.64
	Q max.	kW	38	47	91	38	47	91	38	47	91
	V̇secondary	**m³/h**	1.32	1.64	3.17	1.32	1.64	3.17	1.32	1.64	3.17
50/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32
	V̇primary	**m³/h**	0.7	0.88	1.67	0.61	0.77	1.47	0.54	0.66	1.29
	Q max.	kW	30	38	73	30	38	73	30	38	73
	V̇secondary	**m³/h**	1.31	1.66	3.17	1.31	1.66	3.17	1.31	1.66	3.17
50/35 °C	T return primary	°C	37	37	37	37	37	37	37	37	37
	V̇primary	**m³/h**	0.6	0.73	1.41	0.52	0.63	1.23	0.45	0.55	1.1
	Q max.	kW	23	28	55	23	28	55	23	28	55
	V̇secondary	**m³/h**	1.33	1.63	3.19	1.33	1.63	3.19	1.33	1.63	3.19
45/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32
	V̇primary	**m³/h**	0.52	0.63	1.23	0.46	0.56	1.09	0.41	0.49	0.97
	Q max.	kW	23	28	55	23	28	55	23	28	55
	V̇secondary	**m³/h**	1.33	1.62	3.18	1.33	1.62	3.18	1.33	1.62	3.18
45/35 °C	T return primary	°C	37	37	37	37	37	37	37	37	37
	V̇primary	**m³/h**	0.39	0.48	0.91	0.34	0.42	0.8	0.29	0.37	0.7
	Q max.	kW	15	19	36	15	19	36	15	19	36
	V̇secondary	**m³/h**	1.31	1.65	3.12	1.31	1.65	3.12	1.31	1.65	3.12

Technical data

Performance data

TransTherm giro plus
Integrated control: primary: max. return temperature control
secondary for heating circuits in acc. with table

TransTherm giro plus Type	Mixer circuit	Direct heating circuit	DHW loading circuit	Fresh water module	Spare connection for external heating circuit
(H1/N10-H1/N40)		●			●
(H3/N10-H3/N40)		●	●		
(H5/N10)	●	●		●	
(H8/N10-H8/N40)	●		●		
(H9/N10-H9/N40)		●		●	●

Secondary heating	**TransTherm giro plus**		**District heating**								
			90 °C			**110 °C**			**130 °C**		
			(H1/N10) (H3/N10) (H5/N10) (H8/N10) (H9/N10)	(H1/N20) (H3/N20) (H8/N20) (H9/N20)	(H1/N40) (H3/N40) (H8/N40) (H9/N40)	(H1/N10) (H3/N10) (H5/N10) (H8/N10) (H9/N10)	(H1/N20) (H3/N20) (H8/N20) (H9/N20)	(H1/N40) (H3/N40) (H8/N40) (H9/N40)	(H1/N10) (H3/N10) (H8/N10)	(H1/N20) (H3/N20) (H8/N20)	(H1/N40) (H3/N40) (H8/N40)
75/50 °C	T return primary	°C	54	53	53	52	52	52	52	52	52
	V̇ primary	**m³/h**	0.91	1.12	2.13	0.57	0.7	1.35	0.43	0.53	1.02
	Q max.	kW	38	47	91	38	47	91	38	47	91
	V̇ secondary	**m³/h**	1.33	1.65	3.19	1.33	1.65	3.19	1.33	1.65	3.19
70/50 °C	T return primary	°C	52	52	52	52	52	52	52	52	52
	V̇ primary	**m³/h**	0.68	0.86	1.64	0.45	0.56	1.08	0.34	0.43	0.81
	Q max.	kW	30	38	73	30	38	73	30	38	73
	V̇ secondary	**m³/h**	1.31	1.66	3.19	1.31	1.66	3.19	1.31	1.66	3.19
70/55 °C	T return primary	°C	57	57	57	57	57	57	57	57	57
	V̇ primary	**m³/h**	0.59	0.71	1.4	0.37	0.45	0.89	0.28	0.34	0.66
	Q max.	kW	23	28	55	23	28	55	23	28	55
	V̇ secondary	**m³/h**	1.34	1.64	3.21	1.34	1.64	3.21	1.34	1.64	3.21
65/40 °C	T return primary	°C	42	42	42	42	42	42	42	42	42
	V̇ primary	**m³/h**	0.69	0.85	1.64	0.48	0.6	1.15	0.38	0.47	0.9
	Q max.	kW	38	47	91	38	47	91	38	47	91
	V̇ secondary	**m³/h**	1.33	1.64	3.18	1.33	1.64	3.18	1.33	1.64	3.18
60/40 °C	T return primary	°C	42	42	42	42	42	42	42	42	42
	V̇ primary	**m³/h**	0.53	0.66	1.29	0.24	0.48	0.92	0.3	0.38	0.72
	Q max.	kW	30	38	73	30	38	73	30	38	73
	V̇ secondary	**m³/h**	1.31	1.66	3.18	1.31	1.66	3.18	1.31	1.66	3.18
60/45 °C	T return primary	°C	47	47	47	47	47	47	47	47	47
	V̇ primary	**m³/h**	0.45	0.55	1.08	0.31	0.38	0.75	0.24	0.3	0.58
	Q max.	kW	23	28	55	23	28	55	23	28	55
	V̇ secondary	**m³/h**	1.34	1.63	3.19	1.34	1.63	3.19	1.34	1.63	3.19
55/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32
	V̇ primary	**m³/h**	0.57	0.69	1.35	0.42	0.52	1.01	0.34	0.42	0.81
	Q max.	kW	38	47	91	38	47	91	38	47	91
	V̇ secondary	**m³/h**	1.32	1.64	3.17	1.32	1.64	3.17	1.32	1.64	3.17
50/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32
	V̇ primary	**m³/h**	0.45	0.55	1.07	0.33	0.42	0.81	0.27	0.34	0.65
	Q max.	kW	30	38	73	30	38	73	30	38	73
	V̇ secondary	**m³/h**	1.31	1.66	3.17	1.31	1.66	3.17	1.31	1.66	3.17
50/35 °C	T return primary	°C	37	37	37	37	37	37	37	37	37
	V̇ primary	**m³/h**	0.37	0.45	0.88	0.27	0.33	0.65	0.22	0.26	0.52
	Q max.	kW	23	28	55	23	28	55	23	28	55
	V̇ secondary	**m³/h**	1.33	1.63	3.19	1.33	1.63	3.19	1.33	1.63	3.19
45/30 °C	T return primary	°C	32	32	32	32	32	32	32	32	32
	V̇ primary	**m³/h**	0.34	0.41	0.81	0.26	0.31	0.61	0.21	0.25	0.49
	Q max.	kW	23	28	55	23	28	55	23	28	55
	V̇ secondary	**m³/h**	1.33	1.62	3.18	1.33	1.62	3.18	1.33	1.62	3.18
45/35 °C	T return primary	°C	37	37	37	37	37	37	37	37	37
	V̇ primary	**m³/h**	0.24	0.31	0.58	0.18	0.23	0.43	0.14	0.18	0.34
	Q max.	kW	15	19	36	15	19	36	15	19	36
	V̇ secondary	**m³/h**	1.31	1.65	3.12	1.31	1.65	3.12	1.31	1.65	3.12

Technical data

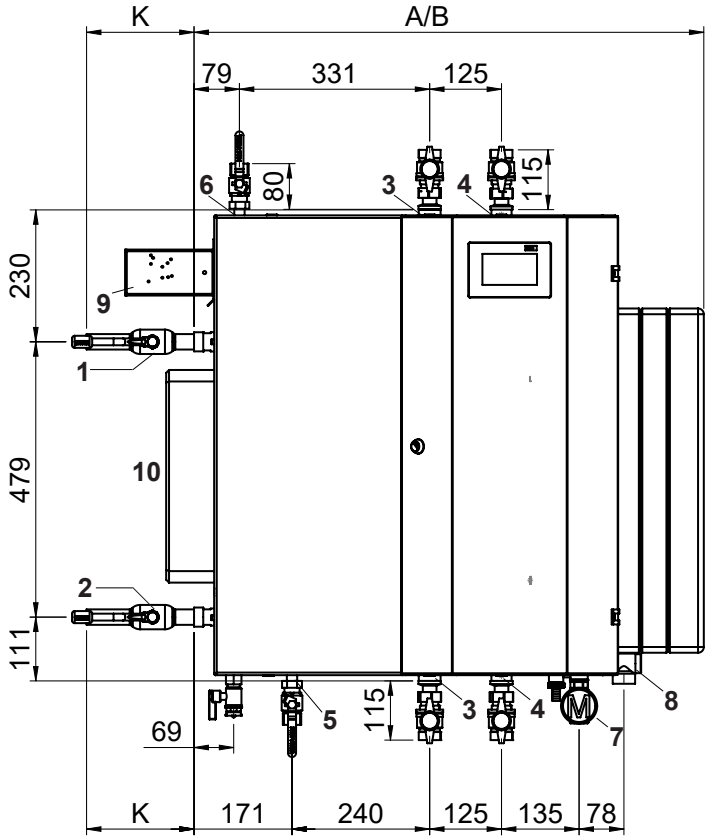
Hot water output, fresh water module

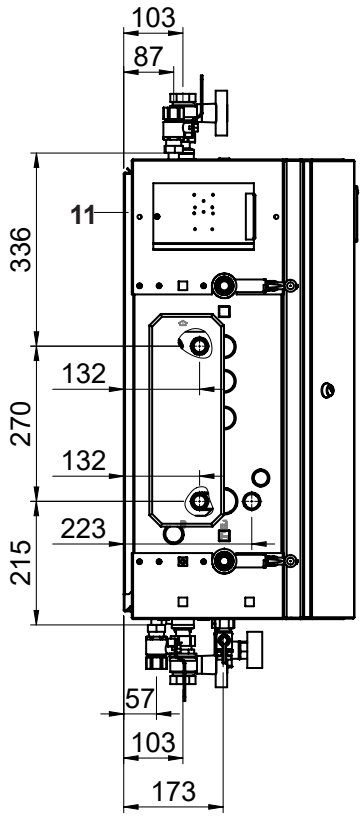
Domestic hot water			Minimum district heating flow operating temperature				
			65 °C (H5/N10) (H9/N10-H9/N40)	**70 °C** (H5/N10) (H9/N10-H9/N40)	**75 °C** (H5/N10) (H9/N10-H9/N40)	**80 °C** (H5/N10) (H9/N10-H9/N40)	**85 °C** (H5/N10) (H9/N10-H9/N40)
45/10 °C	T return primary	°C	19.2	18.3	17	16	15
	V̇primary	m³/h	1.2	1.2	1.07	0.97	0.89
	Q max.	kW	63	71	71	71	71
	V̇secondary	m³/h	1.56	1.76	1.76	1.76	1.76
50/10 °C	T return primary	°C	22.1	20.6	19.5	18.4	17.3
	V̇primary	m³/h	1.2	1.2	1.2	1.15	1.05
	Q max.	kW	59	68	76.5	81.4	81.4
	V̇secondary	m³/h	1.28	1.47	1.65	1.76	1.76
55/10 °C	T return primary	°C	26.4	23.7	22	20.7	19.8
	V̇primary	m³/h	1.2	1.2	1.2	1.2	1.2
	Q max.	kW	53	64	73	81.5	89.5
	V̇secondary	m³/h	1.0	1.23	1.4	1.57	1.72
60/10 °C	T return primary	°C	34.2	28.2	25.3	23.4	22
	V̇primary	m³/h	1.2	1.2	1.2	1.2	1.2
	Q max.	kW	42.5	57.5	68.5	78	86.5
	V̇secondary	m³/h	0.74	0.99	1.19	1.35	1.5
45/15 °C	T return primary	°C	22.1	21	20	19.2	18.6
	V̇primary	m³/h	1.2	1.09	0.97	0.88	0.8
	Q max.	kW	59	61	61	61	61
	V̇secondary	m³/h	1.7	1.76	1.76	1.76	1.76
50/15 °C	T return primary	°C	24.7	23.5	22.5	21.3	20.4
	V̇primary	m³/h	1.2	1.2	1.18	1.06	0.96
	Q max.	kW	55.4	64	71	71	71
	V̇secondary	m³/h	1.37	1.58	1.76	1.76	1.76
55/15 °C	T return primary	°C	28.5	26.3	24.9	23.8	22.7
	V̇primary	m³/h	1.2	1.2	1.2	1.2	1.14
	Q max.	kW	50	60	69	77	81
	V̇secondary	m³/h	1.1	1.3	1.5	1.67	1.76
60/15 °C	T return primary	°C	35.4	30.4	27.9	26.8	25
	V̇primary	m³/h	1.2	1.2	1.2	1.2	1.2
	Q max.	kW	41	54.5	65	73	82
	V̇secondary	m³/h	0.79	1.05	1.25	1.42	1.58
50/20 °C	T return primary	°C	27.6	26.6	25.4	24.5	23.7
	V̇primary	m³/h	1.2	1.2	1.07	0.96	0.87
	Q max.	kW	51	60	61	61	61
	V̇secondary	m³/h	1.49	1.73	1.76	1.76	1.76
55/20 °C	T return primary	°C	31	29.2	27.9	26.9	25.8
	V̇primary	m³/h	1.2	1.2	1.2	1.17	1.05
	Q max.	kW	46.8	56.5	85	71	71
	V̇secondary	m³/h	1.16	1.4	1.61	1.76	1.76
60/20 °C	T return primary	°C	36.8	32.8	30.7	29.3	28.3
	V̇primary	m³/h	1.2	1.2	1.2	1.2	1.2
	Q max.	kW	38.7	51	61	69.5	78
	V̇secondary	m³/h	0.84	1.11	1.32	1.5	1.69

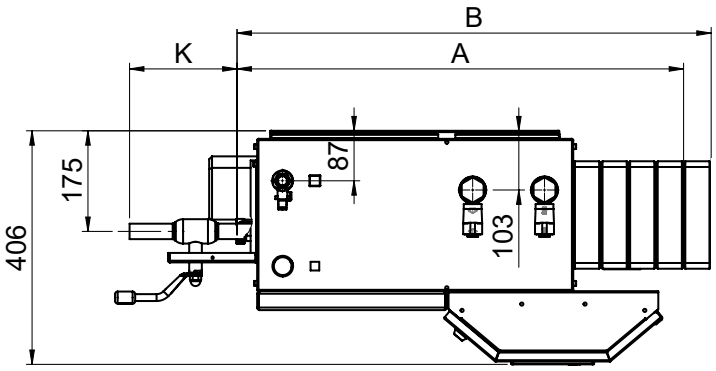
Dimensions

Hoval TransTherm giro plus
(Dimensions in mm)

District heating connection on the left - view of exterior







TransTherm giro plus Type	**Designation**	**without option (ball valve)** mm
(H../N10), (H../N20)	A	791
(H../N40)	B	839

Ball valve option	**Size**	**Connection size**	**K** mm
	DN 20	¾″	85
	DN 25	1″	110
	DN 32	1¼″	115
	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

1	Flow primary	R 1″
2	Return primary	R 1″
3	Flow secondary	Rp 1″
4	Return secondary	Rp 1″
5	Cold water inlet	R ¾″
6	Hot water outlet	R ¾″
7	Connection for expansion tank including ball valves/pressure gauge	Rp ¾″
8	Safety valve	
9	Heat meter calculation unit (option)	
10	Fresh water module	
11	Mounting plate	

Cut-off ball valves
on the primary and secondary side
not included in the scope of delivery (option)

Adapters for heat meter:
PN 16

(H../N10,H../N20)	R ¾″, 110 mm
(H../N40,H../N60)	R 1″, 130 mm
(H../N80)	R 1¼″, 260 mm

PN 25

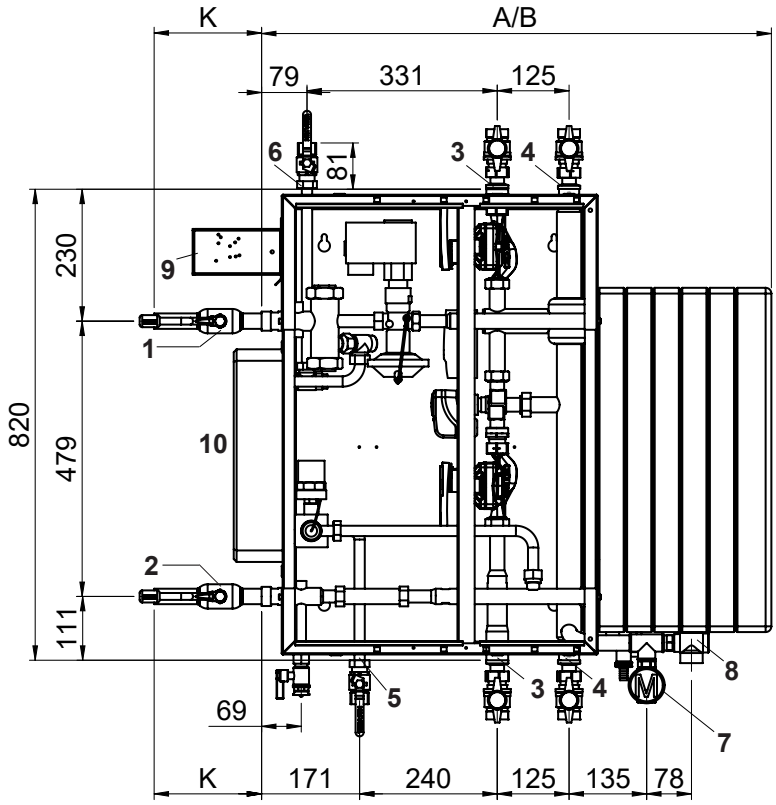
(H../N10-H../N60)	R 1″, 190 mm
(H../N80)	R 1¼″, 260 mm

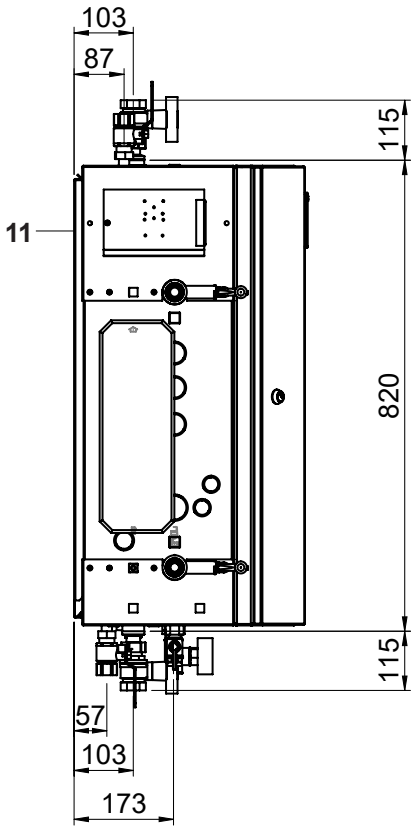
Sensor dimensions
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

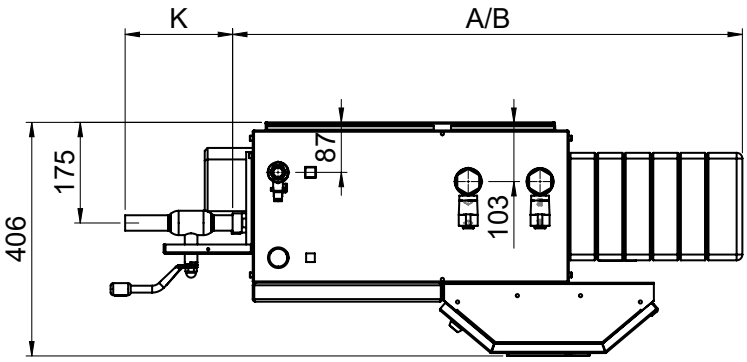
Dimensions

Hoval TransTherm giro plus
(Dimensions in mm)

District heating connection on the left - view of interior







1	Flow primary	R 1″
2	Return primary	R 1″
3	Flow secondary	Rp 1″
4	Return secondary	Rp 1″
5	Cold water inlet	R ¾″
6	Hot water outlet	R ¾″
7	Connection for expansion tank including ball valves/pressure gauge	Rp ¾″
8	Safety valve	
9	Heat meter calculation unit (option)	
10	Fresh water module	
11	Mounting plate	

Cut-off ball valves
on the primary and secondary side
not included in the scope of delivery (option)

TransTherm giro plus Type	**Designation**	**without option (ball valve)** mm
(H../N10), (H../N20)	A	791
(H../N40)	B	839

Ball valve option	**Size**	**Connection size**	**K** mm
	DN 20	¾″	85
	DN 25	1″	110
	DN 32	1¼″	115
	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

Adapters for heat meter:
PN 16

(H../N10,H../N20)	R ¾″, 190 mm
(H../N40,H../N60)	R 1″, 260 mm
(H../N80)	R 1¼″, 260 mm

PN 25

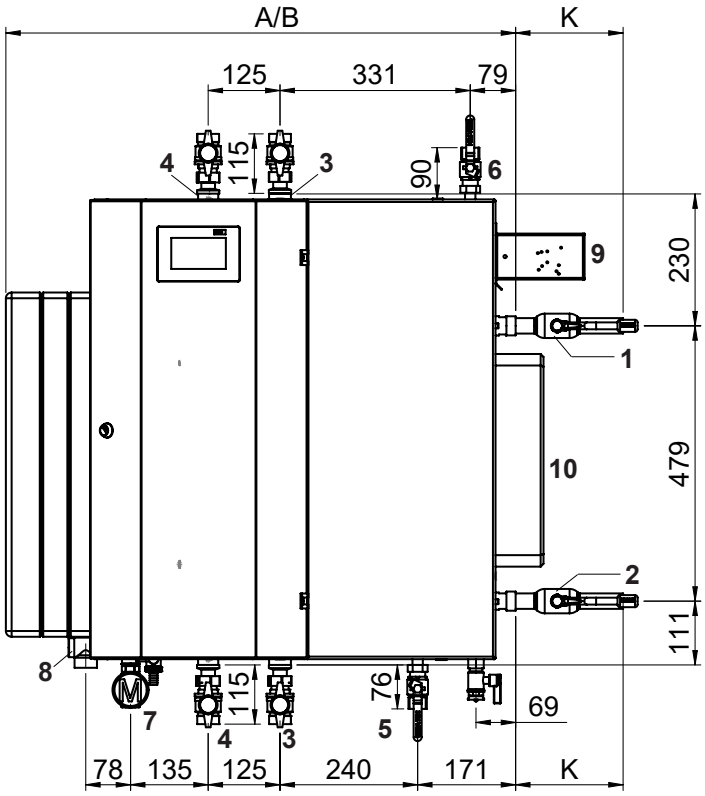
(H../N10-H../N60)	R 1″, 190 mm
(H../N80)	R 1¼″, 260 mm

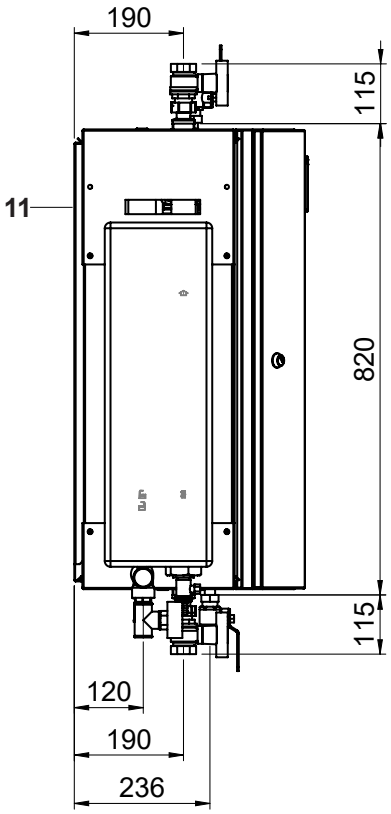
Sensor dimensions
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

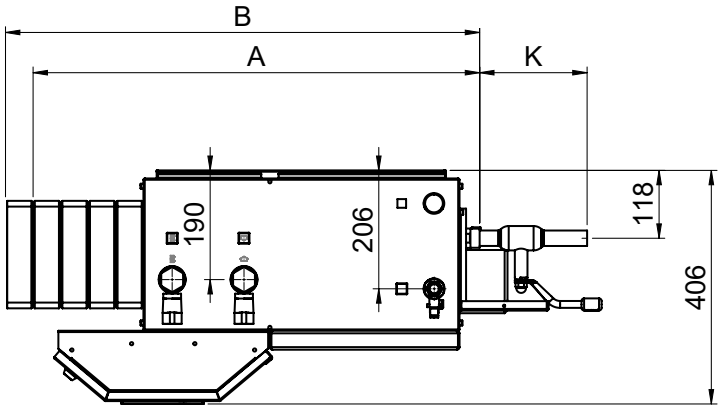
Dimensions

Hoval TransTherm giro plus
(Dimensions in mm)

District heating connection on the right - view of exterior
For this connection type, the casing must be turned through 180° on site.







TransTherm giro plus Type	**Designation**	**without option (ball valve)** mm
(H../N10), (H../N20)	A	791
(H../N40)	B	839

Ball valve option	**Size**	**Connection size**	**K** mm
	DN 20	¾″	85
	DN 25	1″	110
	DN 32	1¼″	115
	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

1	Flow primary	R 1″
2	Return primary	R 1″
3	Flow secondary	Rp 1″
4	Return secondary	Rp 1″
5	Cold water inlet	R ¾″
6	Hot water outlet	R ¾″
7	Connection for expansion tank including ball valves/pressure gauge	Rp ¾″
8	Safety valve	
9	Heat meter calculation unit (option)	
10	Fresh water module	
11	Mounting plate	

Cut-off ball valves
on the primary and secondary side
not included in the scope of delivery (option)

Adapters for heat meter:
PN 16

(H../N10,H../N20)	R ¾″, 190 mm
(H../N40,H../N60)	R 1″, 260 mm
(H../N80)	R 1¼″, 260 mm

PN 25

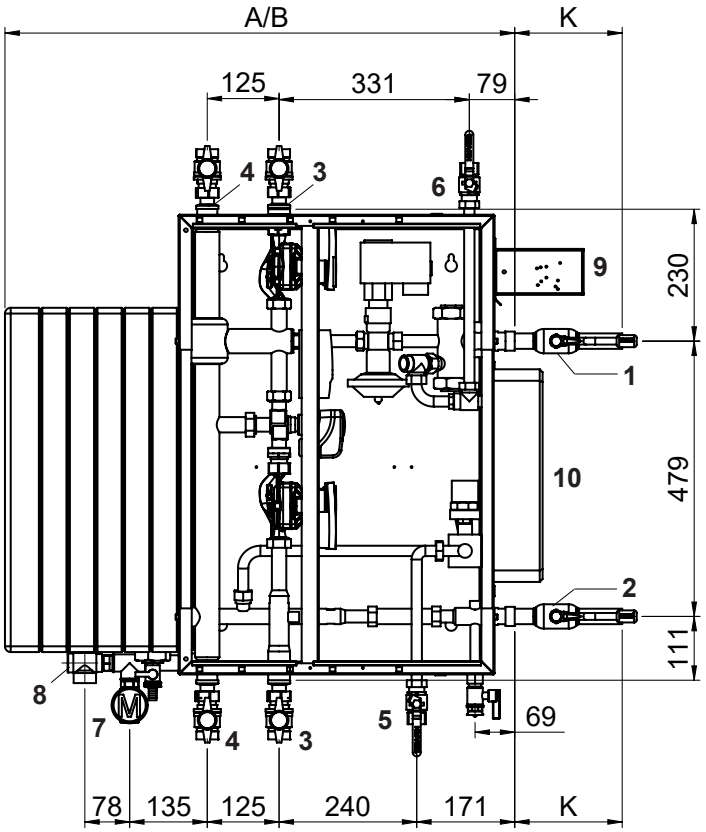
(H../N10-H../N60)	R 1″, 190 mm
(H../N80)	R 1¼″, 260 mm

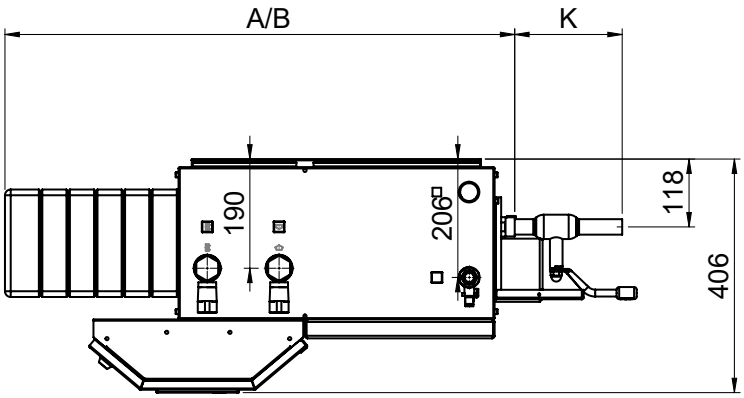
Sensor dimensions
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

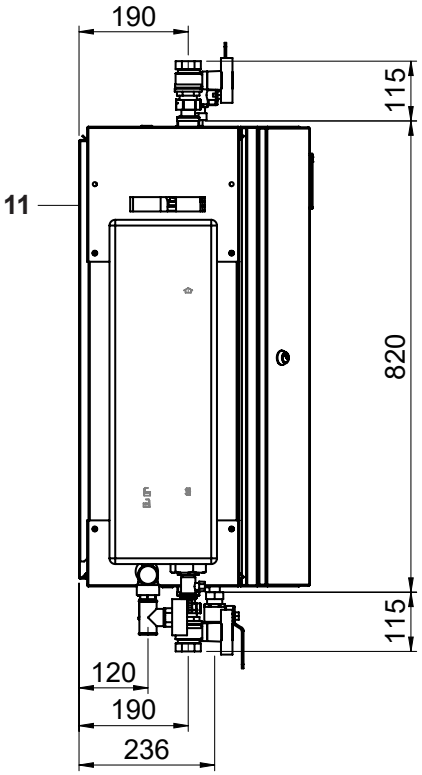
Dimensions

Hoval TransTherm giro plus
(Dimensions in mm)

District heating connection on the right - view of interior
For this connection type, the casing must be turned through 180° on site.







1	Flow primary	R 1″
2	Return primary	R 1″
3	Flow secondary	Rp 1″
4	Return secondary	Rp 1″
5	Cold water inlet	R ¾″
6	Hot water outlet	R ¾″
7	Connection for expansion tank including ball valves/pressure gauge	Rp ¾″
8	Safety valve	
9	Heat meter calculation unit (option)	
10	Fresh water module	
11	Mounting plate	

Cut-off ball valves
on the primary and secondary side
not included in the scope of delivery (option)

TransTherm giro plus Type	**Designation**	**without option (ball valve)** mm
(H../N10), (H../N20)	A	791
(H../N40)	B	839

Ball valve option	**Size**	**Connection size**	**K** mm
	DN 20	¾″	85
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	DN 20	¾″	180
	DN 25	1″	195
	DN 32	1¼″	235

Adapters for heat meter:

PN 16	
(H../N10,H../N20)	R ¾″, 190 mm
(H../N40,H../N60)	R 1″, 260 mm
(H../N80)	R 1¼″, 260 mm
PN 25	
(H../N10-H../N60)	R 1″, 190 mm
(H../N80)	R 1¼″, 260 mm

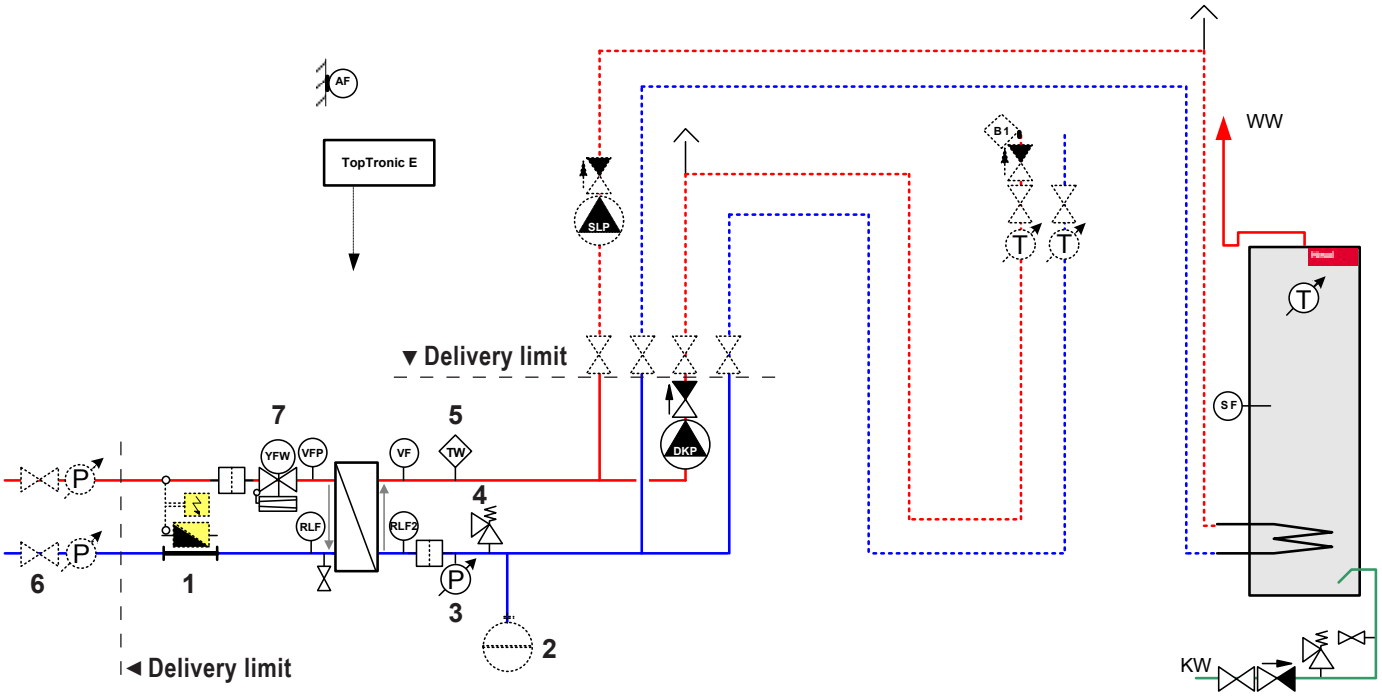
Sensor dimensions
1x M10x1 (27,5-38 mm)
1x ¼″ for immersion sleeve
(length without add-on 35 mm)

Examples

Hoval TransTherm giro plus (H1/N10-H1/N40)

District heating station with
- 1 heater circuit without mixer
- spare connection for external heating circuit e.g. hot water production

Hydraulic schematic BGBE010



Notice:
- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With underfloor heating a flow temperature monitor must be built in.
- Shut-off devices to the safety valve (pressurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

1 Heat meter adapter (heat meter optional)
2 Pressure expansion tank (option)
3 Pressure gauge
4 Safety valve
5 Temperature monitor
Standard on design
120/140/150 °C, 16/25 bar
Optional on design
110 °C/16 bar
6 Shut-off valve (option)
7 Volume flow controller with motorised control valve

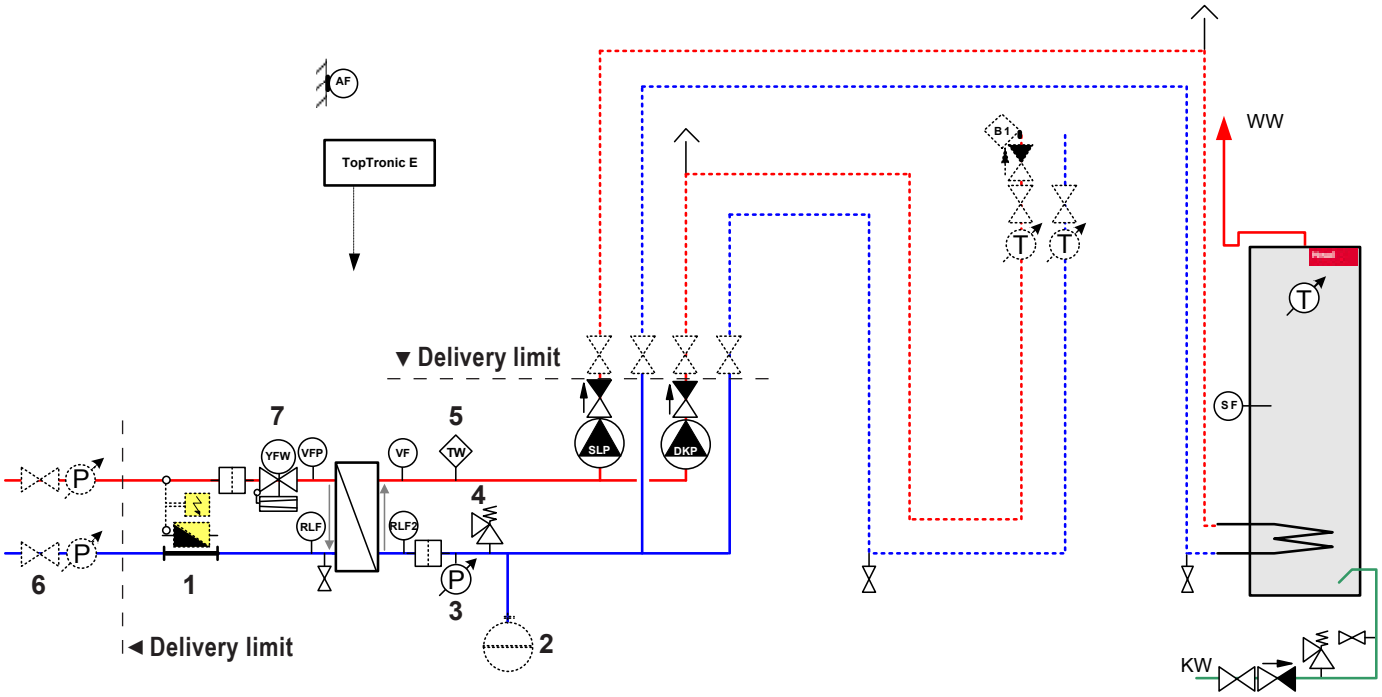
RLF Return sensor
RLF2 Return sensor (secondary)
VFP Flow sensor (primary)
VF Flow sensor (secondary)
AF Outside sensor
SF Buffer sensor
TW Temperature monitor

Examples

Hoval TransTherm giro plus (H3/N10-H3/N40)

District heating station with
- 1 heater circuit without mixer
- hot water production

Hydraulic schematic BGBE020



Notice:
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1 Heat meter adapter (heat meter optional)
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4 Safety valve
5 Temperature monitor
Standard on design
120/140/150 °C, 16/25 bar
Optional on design
110 °C/16 bar
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7 Volume flow controller with motorised control valve

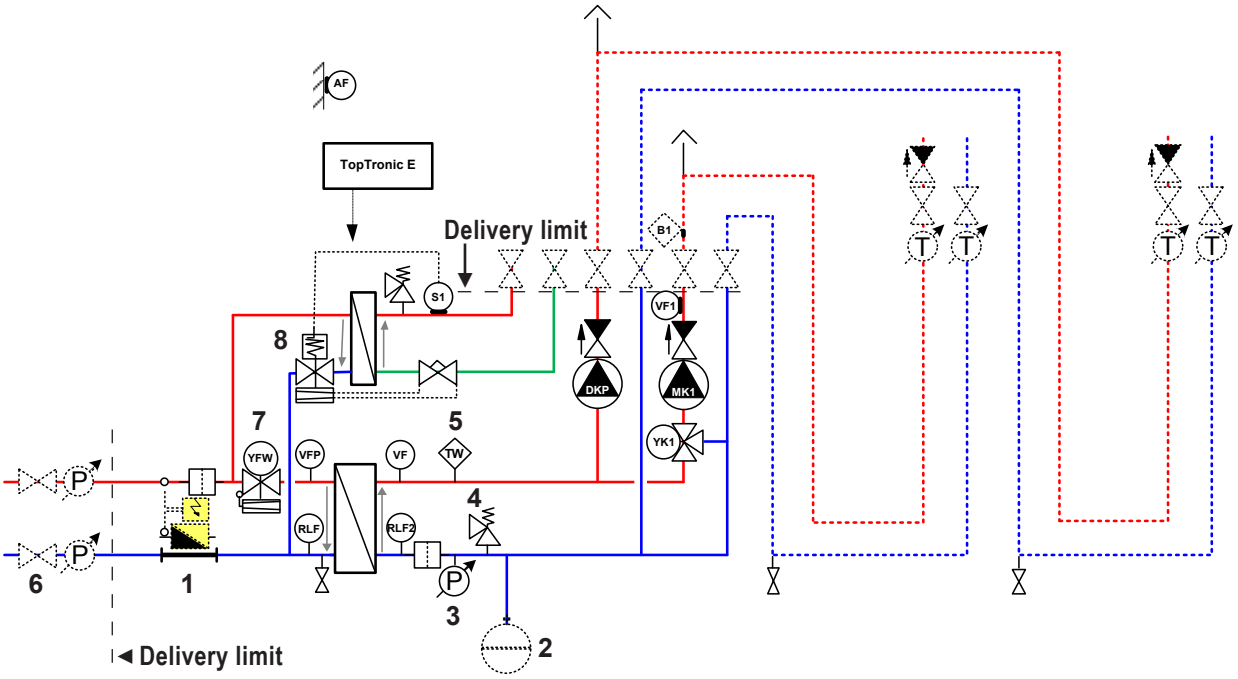
RLF Return sensor
RLF2 Return sensor (secondary)
VFP Flow sensor (primary)
VF Flow sensor (secondary)
AF Outside sensor
SF Buffer sensor
TW Temperature monitor

Examples

Hoval TransTherm giro plus (H5/N10)

District heating station with
- 1 heating circuit with mixer
- 1 heating circuit without mixer
- hot water production, fresh water module

Hydraulic schematic BGBE030



Notice:
- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With underfloor heating a flow temperature monitor must be built in.
- Shut-off devices to the safety valve (pressurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

1 Heat meter adapter (heat meter optional)
2 Pressure expansion tank (option)
3 Pressure gauge
4 Safety valve
5 Temperature monitor
Standard on design
120/140/150 °C, 16/25 bar
Optional on design
110 °C/16 bar
6 Shut-off valve (option)
7 Volume flow controller with motorised control valve
8 Thermal volume flow controller and temperature regulator

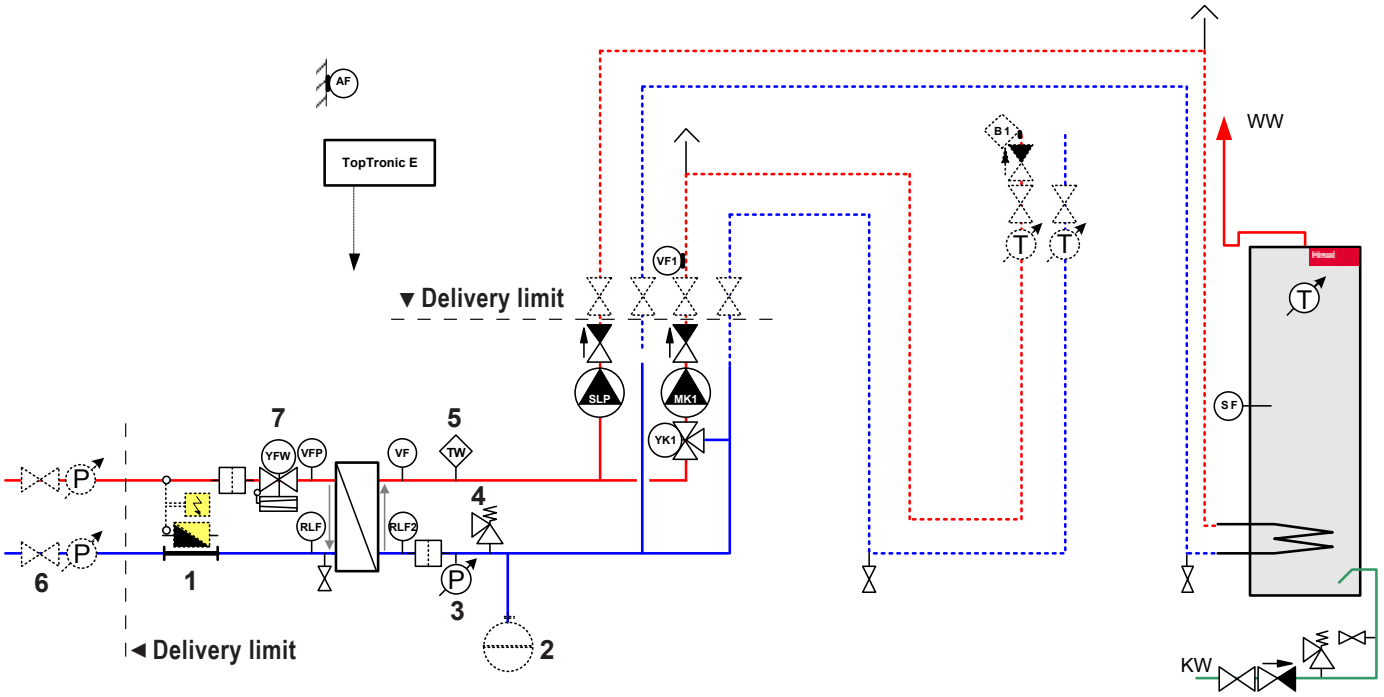
RLF Return sensor
RLF2 Return sensor (secondary)
VFP Flow sensor (primary)
VF Flow sensor (secondary)
AF Outside sensor
SF Buffer sensor
TW Temperature monitor

Examples

Hoval TransTherm giro plus (H8/N10-H8/N40)

District heating station with
- 1 heating circuit with mixer
- hot water production

Hydraulic schematic BGBE060



Notice:
- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With underfloor heating a flow temperature monitor must be built in.
- Shut-off devices to the safety valve (pressurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

1 Heat meter adapter (heat meter optional)
2 Pressure expansion tank (option)
3 Pressure gauge
4 Safety valve
5 Temperature monitor
Standard on design
120/140/150 °C, 16/25 bar
Optional on design
110 °C/16 bar
6 Shut-off valve (option)
7 Volume flow controller with motorised control valve

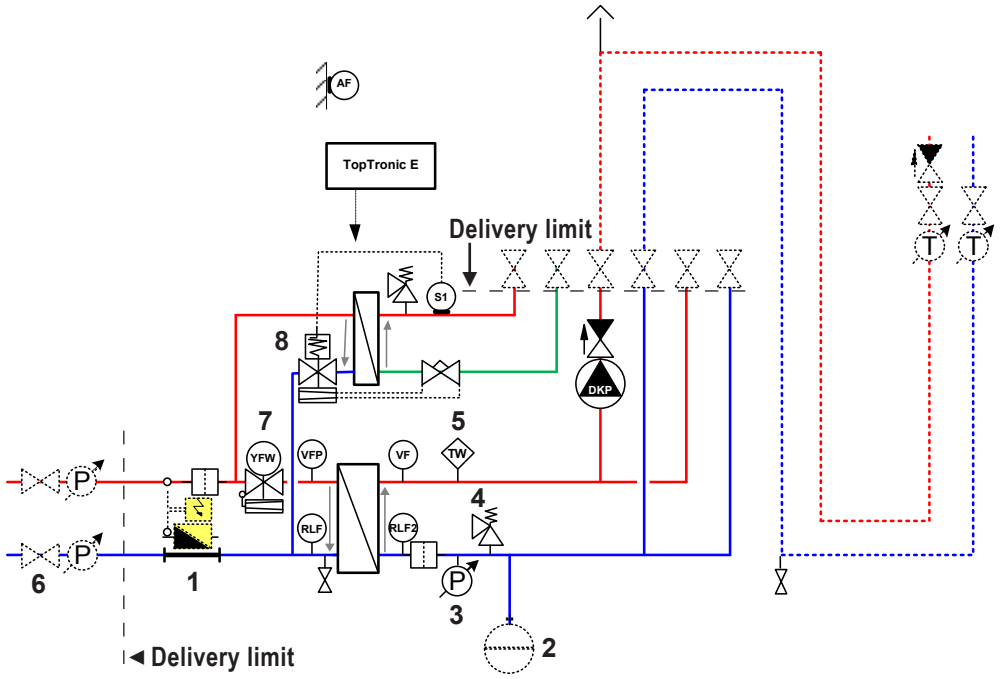
RLF Return sensor
RLF2 Return sensor (secondary)
VFP Flow sensor (primary)
VF Flow sensor (secondary)
AF Outside sensor
SF Buffer sensor
TW Temperature monitor

Examples

Hoval TransTherm giro plus (H9/N10-H9/N40)

District heating station with
- 1 heating circuit without mixer
- hot water production, fresh water module
- spare connection for external heating circuit

Hydraulic schematic BGBE040



Notice:
- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With underfloor heating a flow temperature monitor must be built in.
- Shut-off devices to the safety valve (pressurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

1 Heat meter adapter (heat meter optional)
2 Pressure expansion tank (option)
3 Pressure gauge
4 Safety valve
5 Temperature monitor
Standard on design
120/140/150 °C, 16/25 bar
Optional on design
110 °C/16 bar
6 Shut-off valve (option)
7 Volume flow controller with motorised control valve
8 Thermal volume flow controller and temperature regulator

RLF Return sensor
RLF2 Return sensor (secondary)
VFP Flow sensor (primary)
VF Flow sensor (secondary)
AF Outside sensor
SF Buffer sensor
TW Temperature monitor

Description

Hoval TransTherm pro S

District heating transfer station

- Indirect compact station for heat transfer and regulation of heating and hot water production systems.
- Standard design for heating water in accordance with DIN and AGFW directives.
  District heating primary:
  - Maximum pressure stage 16/25 bar
  - Maximum operating temperature 110-150 °C
  - Maximum volume flow 62 m³/h
  - Connection at the top
  Secondary heating:
  - maximum operating pressure 3 bar
  - Maximum operating temperature 110 °C
  - Maximum volume flow 88 m³/h
  - Connection at the top

Installed

District heating primary:
- 1 volume flow controller with motorised valve, actuator
  - without emergency control function (110 °C) (types F and G, sequential circuit with 2 valves)
  - with emergency control function (140,150 °C) (types F and G, sequential circuit with 2 valves)
- 1 heat meter adapter
- 1 return temperature sensor
- 1 flow temperature sensor
- 2 thermometers
- 1 strainer
- 1 drain

Secondary heating:
- Stainless steel plate heat exchanger in soldered design
- Ball stop valves or shut-off dampers
- 1 Return temperature sensor
- 1 flow temperature sensor
- 1 safety temperature monitor (140,150 °C)
- 2 thermometers
- 1 safety valve 3 bar (membrane-sv)
- 1 pressure gauge
- 1 strainer
- 1 drain
- 1 connection for expansion tank

- District heating station in fully welded and thermally insulated design (50 % thermally insulated, EPP), mounted vibration-free on a steel frame structure and provided with special corrosion protection
- Partial enclosure with powder-coated sheet steel, colour red (RAL 3011)
- Control panel integrated in partial enclosure with
  - TopTronic® E controller
  - Terminals for electrical power supply
  - Circuit breaker
  - Neutral conductor terminal block

Hoval TransTherm pro RS

- Design same as Hoval TransTherm pro S but with completely removable sheet steel enclosure (housing type RS)
- For this version, it is necessary to order the standard Hoval TransTherm pro S design and, in addition, the housing type RS.

Series TransTherm pro S Type	Size	Hydraulics	Number of plates (heat exchanger)	Max. flow temperature °C	nominal pressure bar	Heat output [1] kW
(A/H0/N36/T110/P16)	A	0	36	110	16	149
(A/H0/N36/T140/P16)	A	0	36	140	16	149
(A/H0/N36/T150/P25)	A	0	36	150	25	149
(B/H0/N50/T110/P16)	B	0	50	110	16	195
(B/H0/N50/T140/P16)	B	0	50	140	16	195
(B/H0/N50/T150/P25)	B	0	50	150	25	195
(C/H0/N60/T110/P16)	C	0	60	110	16	241
(C/H0/N60/T140/P16)	C	0	60	140	16	241
(C/H0/N60/T150/P25)	C	0	60	150	25	241
(D/H0/N100/T110/P16)	D	0	100	110	16	402
(D/H0/N100/T140/P16)	D	0	100	140	16	402
(D/H0/N100/T150/P25)	D	0	100	150	25	402
(E/H0/N140/T110/P16)	E	0	140	110	16	460
(E/H0/N140/T140/P16)	E	0	140	140	16	460
(E/H0/N140/T150/P25)	E	0	140	150	25	460
(F/H0/N200/T110/P16)	F	0	200	110	16	575
(F/H0/N200/T140/P16)	F	0	200	140	16	575
(F/H0/N200/T150/P25)	F	0	200	150	25	575
(G/H0/N180/T110/P16)	G	0	180	110	16	915
(G/H0/N180/T140/P16)	G	0	180	140	16	915
(G/H0/N180/T150/P25)	G	0	180	150	25	915
(H/H0/N200/T110/P16)	H	0	200	110	16	1417
(H/H0/N200/T140/P16)	H	0	200	140	16	1417
(H/H0/N200/T150/P25)	H	0	200	150	25	1417

Types F and G, sequential circuit with 2 valves

[1] Reference temperature primary 90-52 °C / secondary 70-50 °C

TransTherm pro S

TransTherm pro RS

TopTronic® E controller

TopTronic® E control panel
- Colour touchscreen 4.3 inch
- Simple, intuitive operating concept
- Display of the most important operating statuses
- Configurable start screen
- Operating mode selection
- Configurable day and week programmes
- Operation of all connected Hoval CAN bus modules
- Commissioning wizard
- Service and maintenance function
- Fault message management
- Analysis function
- Weather display (with HovalConnect option)
- Adaptation of the heating strategy based on the weather forecast (with HovalConnect option)

TopTronic® E basic module district heating com (TTE-FW com)

Control functions integrated for
- primary valve control
- cascade management
- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- various additional functions

- Outdoor sensor
- Immersion sensor (calorifier sensor)
- Contact sensor (flow temperature sensor)
- Complete plug set for DH module

Options for TopTronic® E controller
- Can be expanded by max. 5 module expansions:
  - module expansion heating circuit DH
  - module expansion hot water DH
  - module expansion universal DH

- Can be optionally expanded with various accessories:
  - Ethernet connection TTE-FW com
  - repeater TTE-FW com LON bus
  - router TTE-FW com Ethernet on LON bus
  - data socket 13-pin TTE-FW com LON bus and lighting protection
  - various software licences for HovalSupervisor
  - various services for HovalSupervisor
- Can be networked with a total of up to 16 controller modules:
  - heating circuit/hot water module
  - solar module
  - buffer module
  - measuring module
  - e.g. max 45 mixer circuits

Number of modules that can be additionally installed in the control panel:
- 5 module expansions

Further information about the TopTronic® E
see “Controls”

Description

Design on request
- Volume flow controller with motorised valve, actuator with emergency control function
- Supply of system components such as heat meter, heating armature group, calorifier, loading group etc.
- Hoval control system
- District heating station for direct connection

Delivery
- District heating transfer station already mounted on steel frame structure and ready for electrical connection.
  - TransTherm pro S with partial enclosure
  - TransTherm pro RS with complete enclosure
- Delivered in separate packaging:
  - Temperature sensor set for TopTronic® com

On site
- Installation of heat meter

Part No.

TransTherm pro S

District heating transfer station Hoval TransTherm pro S

Part No.

Indirect compact station for heat transfer and control of heating and water heating plants with built in Hoval TopTronic® E control for controller district heating systems in communicative networks (communications interface to the instrumentation and control system) and the associated consumers

Control function integrated for:
- primary valve control
- cascade management
- 1 heating circuit with mixer
- 1 heating circuit without mixer
- 1 hot water loading circuit
- various additional functions
- types F and G, sequential circuit with 2 valves

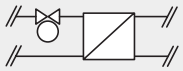
• Can be optionally expanded by max. 5 module expansions:
- module expansion universal district heating

• Can be optionally networked with a total of up to 16 controller modules (incl. solar module)

Incl. outdoor sensor, immersion sensor, contact sensor and complete plug set for DH module

Delivery
• District heating transfer station already mounted on steel frame structure and ready for electrical connection.
- TransTherm pro S with partial enclosure

• Delivered in separate packaging:
- temperature sensor set for TopTronic® E



TransTherm pro S Type	Size	Hydraulics	Number of plates (heat exchanger)	Max. flow temperature °C	Nominal pressure bar	Heat output kW	
(A/H0/N36/T110/P16)	A	0	36	110	16 [1]	149	8005 836
(A/H0/N36/T140/P16)	A	0	36	140	16	149	8005 837
(A/H0/N36/T150/P25)	A	0	36	150	25	149	8005 838
(B/H0/N50/T110/P16)	B	0	50	110	16 [1]	195	8005 839
(B/H0/N50/T140/P16)	B	0	50	140	16	195	8005 840
(B/H0/N50/T150/P25)	B	0	50	150	25	195	8005 841
(C/H0/N60/T110/P16)	C	0	60	110	16 [1]	241	8005 842
(C/H0/N60/T140/P16)	C	0	60	140	16	241	8005 843
(C/H0/N60/T150/P25)	C	0	60	150	25	241	8005 844
(D/H0/N100/T110/P16)	D	0	100	110	16 [1]	402	8005 845
(D/H0/N100/T140/P16)	D	0	100	140	16	402	8005 846
(D/H0/N100/T150/P25)	D	0	100	150	25	402	8005 847
(E/H0/N140/T110/P16)	E	0	140	110	16 [1]	460	8005 848
(E/H0/N140/T140/P16)	E	0	140	140	16	460	8005 849
(E/H0/N140/T150/P25)	E	0	140	150	25	460	8005 850
(F/H0/N200/T110/P16)	F	0	200	110	16 [1]	575	8005 851
(F/H0/N200/T140/P16)	F	0	200	140	16	575	8005 852
(F/H0/N200/T150/P25)	F	0	200	150	25	575	8005 853
(G/H0/N180/T110/P16)	G	0	180	110	16 [1]	915	8005 854
(G/H0/N180/T140/P16)	G	0	180	140	16	915	8005 855
(G/H0/N180/T150/P25)	G	0	180	150	25	915	8005 856
(H/H0/N200/T110/P16)	H	0	200	110	16 [1]	1417	8005 857
(H/H0/N200/T140/P16)	H	0	200	140	16	1417	8005 858
(H/H0/N200/T150/P25)	H	0	200	150	25	1417	8005 859

Types F and G, sequential circuit with 2 valves

[1] Volume flow controller with motorised valve, actuator with emergency control function

■ **Part No.**

TransTherm pro RS

District heating transfer station Hoval TransTherm pro RS — **Part No.**

TransTherm pro RS
consisting of:
- Standard version TransTherm pro S
- Housing type RS
  Completely removable sheet steel enclosure, colour red (RAL 3016)

Delivery
- Sheet steel casing delivered separately, for installation on site

For this version, it is necessary to order the standard Hoval TransTherm pro S design and, in addition, the housing type RS.

Casing RS
fitting TransTherm pro S type

A, B, C, D	8005 001
E, F, G	8005 002

Pressure gauge — 5028 384
0-16 bar, Ø 63 mm
price comprises 1 piece

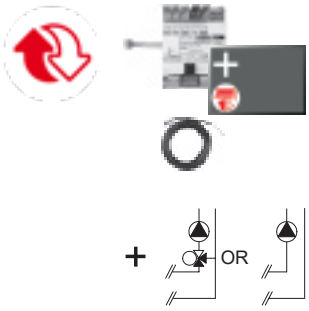
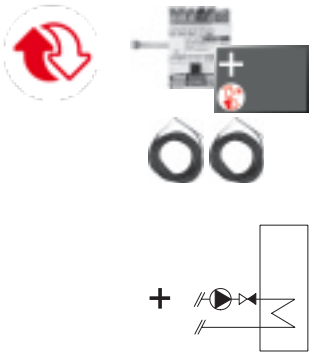
Pressure gauge — 5028 386
0-25 bar, Ø 63 mm
price comprises 1 piece

Accessories

Heat meter Sharky 775
for measurement of the energy consumption in heating and/or refrigeration plants
Operating pressure: PN 25
230 VAC
Approved according to MID
M-BUS

Nominal flow rate qp	Installation length	Sensor	
3.5	260 mm/ R 1¼″	85 mm/ ½″	8005 003
6.0	260 mm/ R 1¼″	85 mm/ ½″	8005 004
10	300 mm/ R 2″	85 mm/ ½″	8005 005
15	270 mm/ DN 50 FL	120 mm/ ½″	8005 006
25	300 mm/ DN 65 FL	120 mm/ ½″	8005 007
40	300 mm/ DN 80 FL	300 mm/ DN 80 FL	8005 008

Part No.

TopTronic® E module expansions for TopTronic® E basic module district heating com	Part No.
 **TopTronic® E module expansion heating circuit district heating TTE-FE HK FW** Expansion to the inputs and outputs of the basic module district heating/fresh water or basic module district heating com for implementing the following functions: - 1 heating/cooling circuit w/o mixer or - 1 heating/cooling circuit with mixer Consisting of: - TopTronic® E module expansion, district heating, - top hat rail with fitting accessories, - ribbon cable for connecting the device bus to the controller module, - connection set for connecting the controller module to the mains voltage, - 1 pce. contact sensor ALF/1.1P/2.5/T, L=2.5 m - complete plug set for module expansions district heating	6038 119
 **TopTronic® E module expansion hot water district heating TTE-FE WW FW** Expansion to the inputs and outputs of the basic module district heating/fresh water or basic module district heating com for implementing a hot water circuit Consisting of: - TopTronic® E module expansion, district heating, - top hat rail with fitting accessories, - ribbon cable for connecting the device bus to the controller module, - connection set for connecting the controller module to the mains voltage, - 2 pcs. immersion sensor TF/1.1P/2.5/6T, L = 2.5 m - complete plug set for module expansions district heating	6038 120
 **TopTronic® E module expansion universal district heating TTE-FE UNI FW** Expansion to the inputs and outputs of a basic module district heating/fresh water or basic module district heating com for implementing various functions. Consisting of: - TopTronic® E module expansion universal district heating - Complete plug set for module expansions - Top hat rail with fitting accessories - Ribbon cable for connecting the device bus to the controller module - Connection set for connecting the controller module to the mains voltage - Complete plug set for module expansions	6038 117

Notice
Refer to the Hoval System Technology to find which functions and hydraulic arrangements can be implemented.

Further information
see “Controls” - “Hoval TopTronic® E module expansions district heating” chapter

Part No.

		Part No.
	**Ethernet connection TopTronic® E district heating com** - Communication module expansion for TopTronic® E basic module district heating com - TCP/IP interface for communication with the HovalSupervisor management system - Top hat rail mounting directly adjacent to the basic module - Connection to the basic module via ribbon cable - Dimensions: 46 x 125 x 51 (L x W x H)	2044 995
	**Repeater TopTronic® E district heating com LonBus** - Repeater as electrical signal booster of the LON bus network - Used for increasing the range of the signal when there are long distances between the control centre and the individual Top-Tronic® E basic module district heating com controller modules - Positioning of the repeaters depending on the data network (routing type, cable type, length, etc.) at different points in the network - Electrical power supply 230 VAC - Dimensions: 71 x 92 x 60 (L x W x H) **Notice** After 5 repeaters, a router must be used for boosting the signal. Article on request.	2045 034
	**Router TopTronic® E district heating com - CAN bus** - Interface between the Hoval LONBus network and HovalSupervisor - Interface between the Hoval TCP/IP network and HovalSupervisor - Serves as a physical interface between the data stream of the district heating network and e.g amaster computer with TCP/IP interface - Possibility of connecting differential pressure sensors variable inputs 0 - 10 V or 0/4 - 20 mA - Router can be installed in control panel with DIN-rail mounting - Temp. and pressure control f. up to five strands or 5 heating circuits - Dimensions: 355 x 120 x 75 (L x W x H) TopTronic® E control module black for operating the router (optional) and mating connector set must be ordered separately.	6047 303

Part No.

	Part No.
Data socket TopTronic® E **district heating com** **LonBus and lightning protection** - Data socket for connecting the telecommunication cable at the building connection - Connection must be made according to the appropriate applicable regulations - Data sockets must also be installed with dummy connections - 1x input block 13-pin - 2x output blocks each 13-pin - 2x outputs 3-pin to controller and repeater - Damp room socket IP55, Dimensions: 180 x 140 x 75 (L x W x H), incl. 10-stage nipple	2061 738

Part No.

HovalConnect available from summer 2019
Up to that point, TopTronic® E online is delivered.

Accessories for TopTronic® E		Part No.
TopTronic® E controller modules		
TTE-HK/WW	TopTronic® E heating circuit/ hot water module	6034 571
TTE-SOL	TopTronic® E solar module	6037 058
TTE-PS	TopTronic® E buffer module	6037 057
TTE-MWA	TopTronic® E measuring module	6034 574
TopTronic® E room control modules		
TTE-RBM	TopTronic® E room control modules	
	easy white	6037 071
	comfort white	6037 069
	comfort black	6037 070
Enhanced language package TopTronic® E one SD card required per control module Consisting of the following languages: HU, CS, SL, RO, PL, TR, ES, HR, SR, JA, DA		6039 253
HovalConnect		
HovalConnect domestic starter LAN		6049 496
HovalConnect domestic starter WLAN		6049 498
HovalConnect commercial starter LAN		6049 495
HovalConnect commercial starter WLAN		6049 497
SMS remote control unit		6018 867
System component SMS remote control unit		6022 797
TopTronic® E interface modules		
GLT module 0-10 V		6034 578
HovalConnect domestic starter Modbus		6049 501
HovalConnect domestic starter KNX		6049 593
HovalConnect commercial starter Modbus		6049 500
HovalConnect commercial starter KNX		6049 502
TopTronic® E wall casing		
WG-190	Wall casing small	6035 563
WG-360	Wall casing medium	6035 564
WG-360 BM	Wall casing medium with control module cut-out	6035 565
WG-510	Wall casing large	6035 566
WG-510 BM	Wall casing large with control module cut-out	6038 533
TopTronic® E sensors district heating		
AF/1.1P/K	Outdoor sensor	2056 774
TF/1.1P/2.5/6T	Immersion sensor, L = 2.5 m	2056 777
ALF/1.1P/2.5/T	Contact sensor, L = 2.5 m	2056 778
TF/1.1P/2.5S/6T	Collector sensor, L = 2.5 m	2056 776
Bivalent switch		2061 826

Further information
see “Controls”

Part No.

	Part No.
Flow temperature controller for underfloor heating systems (1 controller per heating circuit) 15-95 °C, SD 6K, capillary max. 700 mm Setting (visible externally) under the casing cover	
Contact thermostat RAK-TW1000.S Thermostat with retaining strap, without cable and plug	242 902
Contact thermostat set RAK-TW1000.S Thermostat with retaining strap, supplied with cable (4 m) and with plug	6033 745
Immersion thermostat RAK-TW1000.S SB 150 Thermostat with immersion sleeve 1/2″ - immersion depth 150 mm, nickel-plated brass	6010 082

Technical data

	District heating primary									
TransTherm pro S/RS	**Connection size**	**V̇ max.**	**Nominal pressure max.**	**T-max.**	**Valve type**	**Valve nominal width**	**Valve kvs**	**Closing pressure [1]**	**Valve V̇ max.**	**Valve actuator**
Type	DN	m³/h	bar	°C	Danfoss	DN	kvs	bar		Type
(A/H0/N36/T110/P16)	32	3.5	16	110	AVQM	25	8	12	3.5	AMV10
(A/H0/N36/T140/P16)	32	3.5	16	140	AVQM	25	8	12	3.5	AMV13
(A/H0/N36/T150/P25)	32	3.5	25	150	AVQM	25	8	20	3.5	AMV13
(B/H0/N50/T110/P16)	40	6.5	16	110	AVQM	32	12.5	20	8	AMV20
(B/H0/N50/T140/P16)	40	6.5	16	140	AVQM	32	12.5	20	8	AMV23
(B/H0/N50/T150/P25)	40	6.5	25	150	AVQM	32	12.5	20	8	AMV23
(C/H0/N60/T110/P16)	40	6.5	16	110	AVQM	32	12.5	20	8	AMV20
(C/H0/N60/T140/P16)	40	6.5	16	140	AVQM	32	12.5	20	8	AMV23
(C/H0/N60/T150/P25)	40	6.5	25	150	AVQM	32	12.5	20	8	AMV23
(D/H0/N100/T110/P16)	50	10	16	110	AVQM	40	16	20	10	AMV20
(D/H0/N100/T140/P16)	50	10	16	140	AVQM	40	16	20	10	AMV23
(D/H0/N100/T150/P25)	50	10	25	150	AVQM	40	16	20	10	AMV23
(E/H0/N140/T110/P16)	65	12	16	110	AVQM	50	20	20	12.5	AMV20
(E/H0/N140/T140/P16)	65	12	16	140	AVQM	50	20	20	12.5	AMV23
(E/H0/N140/T150/P25)	65	12	25	150	AVQM	50	20	20	12.5	AMV23
(F/H0/N200/T110/P16)	65	16	16	110	2xAVQM	40	16	20	20	2xAMV20
(F/H0/N200/T140/P16)	65	16	16	140	2xAVQM	40	16	20	20	2xAMV23
(F/H0/N200/T150/P25)	65	16	25	150	2xAVQM	40	16	20	20	2xAMV23
(G/H0/N180/T110/P16)	80	25	16	110	2xAVQM	50	20	20	25	2xAMV20
(G/H0/N180/T140/P16)	80	25	16	140	2xAVQM	50	20	20	25	2xAMV23
(G/H0/N180/T150/P25)	80	25	25	150	2xAVQM	50	20	20	25	2xAMV23
(H/H0/N200/T110/P16)	100	40	16	110	AFQM	80	80	16	40	AMV55
(H/H0/N200/T140/P16)	100	40	16	140	AFQM	80	80	20	40	AME659
(H/H0/N200/T150/P25)	100	40	25	150	AFQM	80	80	20	40	AME659

[1] Actuator valve

	Secondary heating				
TransTherm pro S/RS	**Connection size**	**Maximum volume flow**	**Operating pressure max.**	**T-max.**	**Safety function**
Type	DN	m³/h	bar	°C	
(A/H0/N36/T110/P16)	40	6.5	6[1]	110	without
(A/H0/N36/T140/P16)	40	6.5	6[1]	110	STW
(A/H0/N36/T150/P25)	40	6.5	6[1]	110	STW
(B/H0/N50/T110/P16)	50	8.5	6[1]	110	without
(B/H0/N50/T140/P16)	50	8.5	6[1]	110	STW
(B/H0/N50/T150/P25)	50	8.5	6[1]	110	STW
(C/H0/N60/T110/P16)	50	10.5	6[1]	110	without
(C/H0/N60/T140/P16)	50	10.5	6[1]	110	STW
(C/H0/N60/T150/P25)	50	10.5	6[1]	110	STW
(D/H0/N100/T110/P16)	65	17.5	6[1]	110	without
(D/H0/N100/T140/P16)	65	17.5	6[1]	110	STW
(D/H0/N100/T150/P25)	65	17.5	6[1]	110	STW
(E/H0/N140/T110/P16)	80	25	6[1]	110	without
(E/H0/N140/T140/P16)	80	25	6[1]	110	STW
(E/H0/N140/T150/P25)	80	25	6[1]	110	STW
(F/H0/N200/T110/P16)	80	25	6[1]	110	without
(F/H0/N200/T140/P16)	80	25	6[1]	110	STW
(F/H0/N200/T150/P25)	80	25	6[1]	110	STW
(G/H0/N180/T110/P16)	100	40	6[1]	110	without
(G/H0/N180/T140/P16)	100	40	6[1]	110	STW
(G/H0/N180/T150/P25)	100	40	6[1]	110	STW
(H/H0/N200/T110/P16)	125	60	6[1]	110	without
(H/H0/N200/T140/P16)	125	60	6[1]	110	STW
(H/H0/N200/T150/P25)	125	60	6[1]	110	STW

[1] with spring-loaded safety valve
STW = safety temperature monitor

Technical data

Performance data

Trans Therm pro S/RS			District heating															
			70 °C								75 °C							
Heating Secondary			(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)	(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)
85/60 °C	T return primary	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Q max.	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80/60 °C	T return primary	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Q max.	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80/65 °C	T return primary	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Q max.	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
75/50 °C	T return primary	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Q max.	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70/50 °C	T return primary	°C	-	-	-	-	-	-	-	-	53	53	53	53	53	53	58	54
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	**3.5**	**6.5**	**6.5**	**10.0**	**12.1**	**16.0**	**25.0**	**40.0**
	Q max.	kW	-	-	-	-	-	-	-	-	87	161	161	248	298	397	469	941
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	**3.7**	**7.0**	**7.0**	**10.8**	**12.9**	**17.2**	**20.5**	**41.2**
70/55 °C	T return primary	°C	-	-	-	-	-	-	-	-	57	57	57	57	57	57	60	57
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	**3.5**	**6.5**	**6.5**	**10.0**	**12.4**	**16.0**	**25.0**	**40.0**
	Q max.	kW	-	-	-	-	-	-	-	-	71	131	131	206	248	323	404	788
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	**4.1**	**7.6**	**7.6**	**12.0**	**14.4**	**18.7**	**23.5**	**46.0**
65/40 °C	T return primary	°C	45	45	45	45	45	45	51	46	43	43	43	43	43	43	49	44
	V̇ primary	**m³/h**	**3.5**	**6.5**	**6.5**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**6.6**	**6.6**	**10.0**	**12.2**	**16.0**	**25.0**	**40.0**
	Q max.	kW	99	184	184	288	346	454	523	1077	128	237	237	364	437	583	724	1396
	V̇ secondary	**m³/h**	**3.4**	**6.3**	**6.3**	**10.0**	**12.0**	**15.7**	**18.2**	**37.5**	**4.4**	**8.2**	**8.2**	**12.6**	**15.1**	**20.2**	**25.2**	**48.7**
60/40 °C	T return primary	°C	42	42	43	43	43	43	47	42	42	42	42	42	42	42	46	42
	V̇ primary	**m³/h**	**3.5**	**6.2**	**6.5**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**5.2**	**6.4**	**10.0**	**12.2**	**15.4**	**25.0**	**36.8**
	Q max.	kW	111	196	202	311	374	498	648	1228	133	196	242	381	457	576	816	1377
	V̇ secondary	**m³/h**	**4.8**	**8.5**	**8.7**	**13.5**	**16.2**	**21.6**	**28.2**	**53.4**	**5.7**	**8.5**	**10.5**	**16.5**	**19.8**	**25.0**	**35.5**	**60.0**
60/45 °C	T return primary	°C	47	47	47	47	47	47	49	46	47	47	47	47	47	47	49	45
	V̇ primary	**m³/h**	**3.5**	**5.6**	**6.5**	**10.0**	**12.0**	**16.0**	**25.0**	**39.0**	**3.5**	**4.6**	**5.7**	**9.5**	**10.8**	**13.6**	**25.0**	**31.3**
	Q max.	kW	93	147	172	265	318	424	573	1032	113	147	181	302	345	432	733	1032
	V̇ secondary	**m³/h**	**5.3**	**8.5**	**9.9**	**15.3**	**18.4**	**24.5**	**33.3**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
55/30 °C	T return primary	°C	33	33	33	33	33	33	38	33	32	32	32	32	32	32	37	32
	V̇ primary	**m³/h**	**3.5**	**5.8**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**41.8**	**3.5**	**5.0**	**6.2**	**10.0**	**11.9**	**15.0**	**25.0**	**35.9**
	Q max.	kW	150	246	278	428	513	684	885	1726	172	246	303	492	578	722	1049	1726
	V̇ secondary	**m³/h**	**5.1**	**8.5**	**9.6**	**14.8**	**17.7**	**23.6**	**30.7**	**60.0**	**5.9**	**8.5**	**10.5**	**17.0**	**20.0**	**25.0**	**36.4**	**60.0**
50/30 °C	T return primary	°C	32	32	32	32	32	32	36	31	32	32	32	32	32	32	34	31
	V̇ primary	**m³/h**	**3.4**	**4.5**	**5.6**	**9.3**	**10.7**	**13.3**	**25.0**	**31.0**	**3.0**	**4.0**	**4.9**	**8.3**	**9.4**	**11.9**	**20.2**	**27.7**
	Q max.	kW	150	196	243	404	462	578	921	1382	150	196	243	404	462	578	321	1382
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
50/35 °C	T return primary	°C	37	37	37	37	37	37	35	35	37	37	37	37	37	37	37	35
	V̇ primary	**m³/h**	**3.0**	**3.9**	**4.8**	**8.0**	**9.2**	**11.5**	**23.7**	**26.0**	**2.6**	**3.4**	**4.2**	**7.0**	**8.0**	**10.1**	**16.2**	**23.1**
	Q max.	kW	112	147	182	303	346	433	921	1036	112	147	182	303	346	433	690	1036
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
45/30 °C	T return primary	°C	32	32	32	32	32	32	32	30	32	32	32	32	32	32	32	30
	V̇ primary	**m³/h**	**2.6**	**3.4**	**4.2**	**7.0**	**8.0**	**10.0**	**16.3**	**23.1**	**2.3**	**3.0**	**3.7**	**6.2**	**7.1**	**8.9**	**14.2**	**20.5**
	Q max.	kW	113	147	182	303	347	433	691	1037	113	147	182	303	347	433	691	1037
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
45/35 °C	T return primary	°C	37	37	37	37	37	37	35	35	37	37	37	37	37	37	35	35
	V̇ primary	**m³/h**	**2.0**	**2.6**	**3.2**	**5.3**	**6.1**	**7.6**	**11.9**	**17.4**	**1.7**	**2.2**	**2.8**	**4.6**	**5.3**	**6.7**	**10.3**	**15.2**
	Q max.	kW	75	98	121	202	231	288	460	691	75	98	121	202	231	288	460	691
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**

Technical data

Performance data

Trans Therm pro S/RS Heating Secondary			District heating															
			80 °C								85 °C							
			(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)	(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)
85/60 °C	T return primary	°C	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Q max.	kW	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80/60 °C	T return primary	°C	-	-	-	-	-	-	-	-	64	64	64	64	64	64	68	67
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	**3.5**	**6.5**	**6.5**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**
	Q max.	kW	-	-	-	-	-	-	-	-	84	156	156	240	289	385	478	828
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	**3.6**	**6.8**	**6.8**	**10.5**	**12.6**	**16.8**	**21.0**	**36.4**
80/65 °C	T return primary	°C	-	-	-	-	-	-	-	-	67	67	67	67	67	67	71	70
	V̇ primary	**m³/h**	-	-	-	-	-	-	-	-	**3.5**	**6.5**	**6.5**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**
	Q max.	kW	-	-	-	-	-	-	-	-	72	134	134	206	247	329	410	705
	V̇ secondary	**m³/h**	-	-	-	-	-	-	-	-	**4.2**	**7.8**	**7.8**	**12.0**	**14.4**	**19.2**	**24.1**	**41.4**
75/50 °C	T return primary	°C	55	55	55	55	55	55	61	60	53	53	53	53	53	53	59	58
	V̇ primary	**m³/h**	**3.5**	**6.6**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**6.6**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**
	Q max.	kW	101	187	187	287	345	460	536	931	129	239	239	368	441	589	737	1258
	V̇ secondary	**m³/h**	**3.5**	**6.5**	**6.5**	**10.0**	**12.0**	**16.0**	**18.8**	**32.6**	**4.4**	**8.3**	**8.3**	**12.8**	**15.3**	**20.4**	**25.8**	**44.1**
70/50 °C	T return primary	°C	52	52	53	53	53	53	57	56	52	52	52	52	52	52	56	55
	V̇ primary	**m³/h**	**3.5**	**6.1**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**5.2**	**6.4**	**10.0**	**12.0**	**15.4**	**25.0**	**40.0**
	Q max.	kW	113	195	205	316	379	506	659	1118	133	195	241	379	455	575	825	1385
	V̇ secondary	**m³/h**	**4.9**	**8.5**	**8.9**	**13.7**	**16.5**	**22.0**	**28.8**	**48.9**	**5.7**	**8.5**	**10.5**	**16.5**	**19.8**	**25.0**	**36.1**	**60.6**
70/55 °C	T return primary	°C	57	57	57	57	57	57	60	59	57	57	57	57	57	57	59	58
	V̇ primary	**m³/h**	**3.5**	**5.6**	**6.5**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**4.6**	**5.7**	**9.5**	**10.8**	**13.6**	**23.0**	**34.1**
	Q max.	kW	92	146	171	264	317	422	580	978	112	146	181	301	344	430	685	1062
	V̇ secondary	**m³/h**	**5.3**	**8.5**	**9.9**	**15.3**	**18.4**	**24.5**	**33.9**	**57.1**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**
65/40 °C	T return primary	°C	43	43	43	43	43	43	49	47	42	42	42	42	42	42	48	46
	V̇ primary	**m³/h**	**3.5**	**5.8**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**5.0**	**6.2**	**10.0**	**11.9**	**14.9**	**25.0**	**39.9**
	Q max.	kW	149	245	277	427	512	683	900	1519	174	245	303	496	577	721	1062	1777
	V̇ secondary	**m³/h**	**5.1**	**8.5**	**9.6**	**14.8**	**17.7**	**23.6**	**31.4**	**53.0**	**6.0**	**8.5**	**10.5**	**17.2**	**20.0**	**25.0**	**37.1**	**62.0**
60/40 °C	T return primary	°C	42	42	42	42	42	42	46	43.7	42	42	42	42	42	42	45	43
	V̇ primary	**m³/h**	**3.4**	**4.5**	**5.6**	**9.3**	**10.7**	**13.4**	**23.4**	**34.7**	**3.0**	**4.0**	**5.0**	**8.3**	**9.5**	**11.9**	**20.0**	**30.0**
	Q max.	kW	150	196	242	404	461	576	918	1423	150	196	242	404	461	576	918	1423
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**
60/45 °C	T return primary	°C	47	47	47	47	47	47	48	47	47	47	47	47	47	47	48	47
	V̇ primary	**m³/h**	**3.0**	**3.9**	**4.8**	**8.1**	**9.2**	**11.6**	**18.9**	**28.5**	**2.6**	**3.4**	**4.2**	**7.0**	**8.0**	**10.1**	**16.1**	**24.5**
	Q max.	kW	112	147	181	302	345	432	688	1066	112	147	181	302	345	432	688	1066
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**
55/30 °C	T return primary	°C	32	32	32	32	32	32	37	31	32	32	32	32	32	32	35	31
	V̇ primary	**m³/h**	**3.4**	**4.5**	**5.5**	**9.3**	**10.6**	**13.3**	**23.7**	**32.8**	**3.1**	**4.1**	**5.0**	**8.4**	**9.6**	**12.1**	**20.8**	**29.5**
	Q max.	kW	188	246	303	506	578	722	1151	1784	188	246	303	506	578	722	1151	1784
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**
50/30 °C	T return primary	°C	32	32	32	32	32	32	33	30	32	32	32	32	32	32	35	30
	V̇ primary	**m³/h**	**2.7**	**3.6**	**4.4**	**7.4**	**8.5**	**10.7**	**17.6**	**25.6**	**2.5**	**3.2**	**4.0**	**6.7**	**7.7**	**9.7**	**20.7**	**23.0**
	Q max.	kW	150	196	243	404	462	578	921	1428	150	196	243	404	462	578	1151	1428
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**
50/35 °C	T return primary	°C	37	37	37	37	37	37	37	35	37	37	37	37	37	37	36	35
	V̇ primary	**m³/h**	**2.3**	**3.0**	**3.7**	**6.2**	**7.1**	**8.9**	**14.2**	**21.1**	**2.0**	**2.7**	**3.3**	**5.6**	**6.4**	**8.0**	**12.6**	**19.0**
	Q max.	kW	112	147	182	303	346	433	690	1070	112	147	182	303	346	433	690	1070
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**
45/30 °C	T return primary	°C	32	32	32	32	32	32	31	30	32	32	32	32	32	32	31	30
	V̇ primary	**m³/h**	**2.0**	**2.7**	**3.3**	**5.5**	**6.3**	**8.0**	**12.6**	**19.1**	**1.8**	**2.4**	**3.0**	**5.0**	**5.8**	**7.3**	**11.4**	**17.4**
	Q max.	kW	113	147	182	303	347	433	691	1072	113	147	182	302	347	433	691	1072
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**
45/35 °C	T return primary	°C	37	37	37	37	37	37	35	35	37	37	37	37	37	37	35	35
	V̇ primary	**m³/h**	**1.5**	**2.0**	**2.4**	**4.1**	**4.7**	**5.9**	**9.1**	**14.0**	**1.3**	**1.8**	**2.2**	**3.7**	**4.2**	**5.3**	**8.2**	**12.6**
	Q max.	kW	75	98	121	202	231	288	460	714	75	98	121	202	231	288	460	714
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**

Technical data

Performance data

Trans Therm pro S/RS Heating secondary			District heating															
			90 °C								95 °C							
			(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)	(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)
85/60 °C	T return primary	°C	65	65	65	65	65	65	71	67	63	63	63	63	63	63	69	67
	V̇ primary	**m³/h**	**3.5**	**6.6**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**6.6**	**6.6**	**10.0**	**12.0**	**16.3**	**25.0**	**40.0**
	Q max.	kW	100	186	186	286	344	458	546	950	128	238	238	367	440	587	746	1274
	V̇ secondary	**m³/h**	**3.5**	**6.5**	**6.5**	**10.0**	**12.0**	**16.0**	**19.2**	**33.4**	**4.4**	**8.3**	**8.3**	**12.8**	**15.3**	**20.4**	**26.2**	**44.8**
80/60 °C	T return primary	°C	62	62	62	62	62	62	67	65	62	62	62	62	62	62	66	61
	V̇ primary	**m³/h**	**3.5**	**6.1**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**5.2**	**6.5**	**10.0**	**12.0**	**15.5**	**25.0**	**36.3**
	Q max.	kW	112	195	208	321	385	513	667	1132	132	195	240	378	453	572	832	1366
	V̇ secondary	**m³/h**	**4.9**	**8.5**	**9.1**	**14.0**	**16.8**	**22.4**	**29.3**	**49.7**	**5.7**	**8.5**	**10.5**	**16.5**	**19.8**	**25.0**	**36.6**	**60.0**
80/65 °C	T return primary	°C	67	67	67	67	67	67	71	68	67	67	67	67	67	67	69	65
	V̇ primary	**m³/h**	**3.5**	**5.6**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**4.6**	**5.7**	**9.0**	**10.9**	**13.7**	**22.7**	**31.1**
	Q max.	kW	92	146	171	263	315	420	546	987	112	146	180	300	343	428	682	1023
	V̇ secondary	**m³/h**	**5.3**	**8.5**	**9.9**	**15.3**	**18.4**	**24.5**	**19.2**	**57.8**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
75/50 °C	T return primary	°C	52	52	52	52	52	52	58	56	52	52	52	52	52	52	57	51
	V̇ primary	**m³/h**	**3.5**	**5.7**	**6.6**	**10.0**	**12.0**	**16.0**	**25.0**	**40.0**	**3.5**	**5.0**	**6.2**	**10.0**	**11.9**	**14.9**	**25.0**	**35.4**
	Q max.	kW	153	244	284	437	524	699	910	1537	173	244	302	494	575	718	1072	1713
	V̇ secondary	**m³/h**	**5.3**	**8.5**	**9.8**	**15.2**	**18.2**	**24.3**	**31.9**	**53.8**	**6.0**	**8.5**	**10.5**	**17.2**	**20.0**	**25.0**	**37.6**	**60.0**
70/50 °C	T return primary	°C	52	52	52	52	52	52	55	54	52	52	52	52	52	52	54	50
	V̇ primary	**m³/h**	**3.5**	**4.5**	**5.6**	**9.4**	**10.7**	**13.5**	**23.1**	**34.3**	**3.1**	**4.0**	**5.0**	**8.3**	**9.5**	**11.9**	**19.8**	**27.6**
	Q max.	kW	149	195	241	402	460	575	915	1417	149	195	241	402	460	575	915	1372
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
70/55 °C	T return primary	°C	57	57	57	57	57	57	58	57	57	57	57	57	57	57	57	55
	V̇ primary	**m³/h**	**3.0**	**3.9**	**4.8**	**8.1**	**9.2**	**11.6**	**18.8**	**28.3**	**2.6**	**3.4**	**4.2**	**7.0**	**8.0**	**10.1**	**16.0**	**23.0**
	Q max.	kW	112	146	181	301	344	430	685	1062	112	146	181	301	344	430	685	1028
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
65/40 °C	T return primary	°C	42	42	42	42	42	42	47	45	42	42	42	42	42	42	46	41
	V̇ primary	**m³/h**	**3.4**	**4.5**	**5.6**	**9.3**	**10.6**	**13.4**	**23.3**	**34.7**	**3.1**	**4.1**	**5.1**	**8.5**	**9.7**	**12.1**	**20.5**	**28.4**
	Q max.	kW	187	245	303	504	577	721	1146	1777	187	245	303	504	577	721	1146	1720
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
60/40 °C	T return primary	°C	42	42	42	42	42	42	44	43	42	42	42	42	42	42	43	40
	V̇ primary	**m³/h**	**2.7**	**3.6**	**4.4**	**7.4**	**8.5**	**10.7**	**17.5**	**26.5**	**2.5**	**3.3**	**4.0**	**6.8**	**7.7**	**9.7**	**15.7**	**22.5**
	Q max.	kW	150	196	242	404	461	576	918	1423	150	196	242	404	461	576	918	1377
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
60/45 °C	T return primary	°C	47	47	47	47	47	47	47	46	47	47	47	47	47	47	47	45
	V̇ primary	**m³/h**	**2.3**	**3.0**	**3.7**	**6.2**	**7.1**	**8.9**	**14.1**	**21.6**	**2.0**	**2.7**	**3.3**	**5.6**	**6.4**	**8.0**	**12.6**	**18.4**
	Q max.	kW	112	147	181	302	345	432	688	1066	112	147	181	302	345	432	688	1032
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
55/30 °C	T return primary	°C	32	32	32	32	32	32	34	31	32	32	32	32	32	32	34	30
	V̇ primary	**m³/h**	**2.8**	**3.7**	**4.6**	**7.7**	**8.8**	**11.1**	**18.6**	**26.9**	**2.6**	**3.4**	**4.3**	**7.1**	**8.2**	**10.2**	**16.8**	**24.0**
	Q max.	kW	188	246	303	506	578	722	1151	1784	188	246	303	506	578	722	1151	1726
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
50/30 °C	T return primary	°C	32	32	32	32	32	32	32	30	32	32	32	32	32	32	32	30
	V̇ primary	**m³/h**	**2.3**	**3.0**	**3.7**	**6.2**	**7.1**	**8.9**	**14.3**	**21.3**	**2.1**	**2.7**	**3.4**	**5.7**	**6.5**	**8.2**	**13.1**	**19.0**
	Q max.	kW	150	196	243	404	462	578	921	1428	150	196	243	404	462	578	921	1382
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
50/35 °C	T return primary	°C	37	37	37	37	37	37	36	35	37	37	37	37	37	37	35	30
	V̇ primary	**m³/h**	**1.8**	**2.4**	**3.0**	**5.0**	**5.8**	**7.3**	**11.4**	**17.3**	**1.7**	**2.2**	**2.8**	**4.6**	**5.3**	**6.7**	**10.4**	**19.0**
	Q max.	kW	112	147	182	303	346	433	690	1070	112	147	182	303	346	433	690	1036
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
45/30 °C	T return primary	°C	32	32	32	32	32	32	30	30	32	32	32	32	32	32	30	30
	V̇ primary	**m³/h**	**1.7**	**2.2**	**2.7**	**4.6**	**5.3**	**6.7**	**10.4**	**16.0**	**1.6**	**2.0**	**2.5**	**4.3**	**4.9**	**6.2**	**9.6**	**14.2**
	Q max.	kW	113	147	182	303	347	433	691	1072	113	147	182	303	347	433	691	1037
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
45/35 °C	T return primary	°C	37	37	37	37	37	37	35	35	37	37	37	37	37	37	35	35
	V̇ primary	**m³/h**	**1.2**	**1.6**	**2.0**	**3.3**	**3.8**	**4.9**	**7.5**	**11.6**	**1.1**	**1.5**	**1.8**	**3.1**	**3.5**	**4.4**	**6.8**	**10.2**
	Q max.	kW	75	98	121	202	231	288	460	714	75	98	121	202	231	288	460	691
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**62.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**

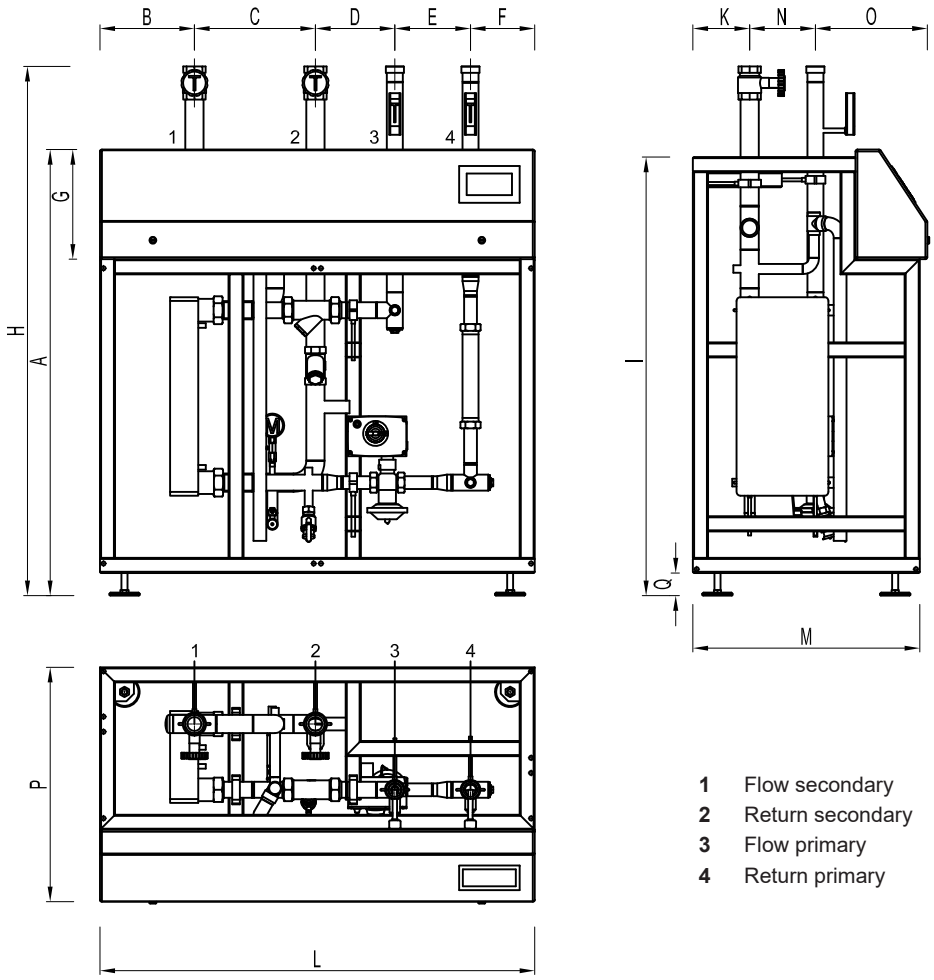
Technical data

Performance data

Trans Therm pro S/RS Heating secondary			District heating															
			110 °C								130 °C							
			(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)	(A/H0/N36..)	(B/H0/N50..)	(C/H0/N60..)	(D/H0/N100..)	(E/H0/N140..)	(F/H0/N200..)	(G/H0/N180..)	(H/H0/N200..)
85/60 °C	T return primary	°C	63	63	63	63	63	63	65	61	63	63	63	63	63	63	62	60
	V̇ primary	**m³/h**	**3.5**	**4.6**	**5.7**	**9.6**	**10.9**	**13.7**	**22.0**	**31.4**	**2.5**	**3.3**	**4.1**	**6.8**	**7.8**	**9.8**	**15.3**	**22.3**
	Q max.	kW	186	243	301	501	573	716	1137	1706	186	243	301	501	573	716	1137	1706
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
80/60 °C	T return primary	°C	62	62	62	62	62	62	62	60	62	62	62	62	62	62	61	60
	V̇ primary	**m³/h**	**2.7**	**3.6**	**4.5**	**7.5**	**8.5**	**10.7**	**17.3**	**24.7**	**2.0**	**2.6**	**3.2**	**5.3**	**6.1**	**7.7**	**12.0**	**17.8**
	Q max.	kW	149	195	240	401	458	572	910	1366	149	195	240	401	458	572	910	1366
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
80/65 °C	T return primary	°C	67	67	67	67	67	67	66	65	67	67	67	67	67	67	65	65
	V̇ primary	**m³/h**	**2.3**	**3.0**	**3.7**	**6.2**	**7.1**	**9.0**	**14.0**	**20.3**	**1.6**	**2.1**	**2.6**	**4.3**	**4.9**	**6.2**	**9.6**	**14.3**
	Q max.	kW	111	146	180	300	343	428	682	1023	111	146	180	300	343	428	682	1023
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
75/50 °C	T return primary	°C	52	52	52	52	52	52	53	50	52	52	52	52	52	52	51	50
	V̇ primary	**m³/h**	**2.9**	**3.8**	**4.6**	**7.8**	**8.9**	**11.2**	**18.3**	**26.0**	**2.1**	**2.8**	**3.5**	**5.9**	**6.7**	**8.4**	**13.3**	**19.6**
	Q max.	kW	187	244	302	503	575	718	1142	1713	187	244	302	503	575	718	1142	1713
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
70/50 °C	T return primary	°C	52	52	52	52	52	52	51	50	52	52	52	52	52	52	50	50
	V̇ primary	**m³/h**	**2.3**	**3.0**	**3.7**	**6.2**	**7.1**	**8.9**	**14.8**	**20.6**	**1.7**	**2.2**	**2.8**	**4.7**	**5.3**	**6.7**	**10.5**	**15.9**
	Q max.	kW	149	195	241	402	460	575	914	1372	149	195	241	402	460	575	914	1372
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
70/55 °C	T return primary	°C	57	57	57	57	57	57	55	55	57	57	57	57	57	57	55	55
	V̇ primary	**m³/h**	**1.9**	**2.4**	**3.0**	**5.1**	**5.8**	**7.3**	**11.4**	**16.8**	**1.4**	**1.8**	**2.2**	**3.7**	**4.3**	**5.4**	**8.3**	**12.5**
	Q max.	kW	112	146	181	301	344	430	685	1028	112	146	181	301	344	430	685	1028
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
65/40 °C	T return primary	°C	42	42	42	42	42	42	43	40	42	42	42	42	42	42	41	40
	V̇ primary	**m³/h**	**2.4**	**3.2**	**4.0**	**6.6**	**7.6**	**9.6**	**15.4**	**22.2**	**1.9**	**2.5**	**3.1**	**5.2**	**6.0**	**7.5**	**11.8**	**17.5**
	Q max.	kW	187	245	303	504	577	721	1146	1720	187	245	303	504	577	721	1146	1720
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
60/40 °C	T return primary	°C	42	42	42	42	42	42	41	40	42	42	42	42	42	42	40	40
	V̇ primary	**m³/h**	**1.9**	**2.6**	**3.2**	**5.3**	**6.1**	**7.7**	**12.0**	**17.7**	**1.5**	**2.0**	**2.5**	**4.2**	**4.8**	**6.0**	**9.4**	**14.0**
	Q max.	kW	150	196	242	404	461	576	918	1377	150	196	242	404	461	576	918	1377
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
60/45 °C	T return primary	°C	47	47	47	47	47	47	45	45	47	47	47	47	47	47	45	45
	V̇ primary	**m³/h**	**1.6**	**2.1**	**2.5**	**4.3**	**4.9**	**6.2**	**9.6**	**14.3**	**1.2**	**1.6**	**2.0**	**3.3**	**3.8**	**4.8**	**7.4**	**11.1**
	Q max.	kW	112	147	181	302	345	432	687	1032	112	147	181	302	345	432	687	1032
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
55/30 °C	T return primary	°C	32	32	32	32	32	32	32	30	32	32	32	32	32	32	31	30
	V̇ primary	**m³/h**	**2.1**	**2.8**	**3.5**	**5.8**	**6.6**	**8.4**	**13.4**	**19.5**	**1.7**	**2.3**	**2.8**	**4.7**	**5.4**	**6.8**	**10.6**	**15.8**
	Q max.	kW	188	246	303	506	578	722	1151	1726	188	246	303	506	578	722	1151	1726
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
50/30 °C	T return primary	°C	32	32	32	32	32	32	31	30	32	32	32	32	32	32	30	30
	V̇ primary	**m³/h**	**1.7**	**2.2**	**2.8**	**4.6**	**5.3**	**6.7**	**10.5**	**15.6**	**1.4**	**1.8**	**2.2**	**3.7**	**4.3**	**5.4**	**8.4**	**12.6**
	Q max.	kW	150	196	243	404	462	578	921	1382	150	196	243	404	462	578	921	1382
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
50/35 °C	T return primary	°C	37	37	37	37	37	37	35	35	37	37	37	37	37	37	35	35
	V̇ primary	**m³/h**	**1.3**	**1.8**	**2.2**	**3.7**	**4.2**	**5.4**	**8.3**	**12.4**	**1.1**	**1.4**	**1.7**	**2.9**	**3.4**	**4.3**	**6.6**	**9.9**
	Q max.	kW	112	147	182	303	346	433	690	1036	112	147	182	303	346	433	690	1036
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
45/30 °C	T return primary	°C	32	32	32	32	32	32	30	30	32	32	32	32	32	32	30	30
	V̇ primary	**m³/h**	**1.3**	**1.7**	**2.1**	**3.5**	**4.0**	**5.0**	**7.8**	**11.7**	**1.0**	**1.3**	**1.7**	**2.8**	**3.2**	**4.1**	**6.3**	**9.5**
	Q max.	kW	113	147	182	303	347	433	691	1037	113	147	182	303	347	433	691	1037
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**
45/35 °C	T return primary	°C	37	37	37	37	37	37	35	35	37	37	37	37	37	37	35	35
	V̇ primary	**m³/h**	**0.9**	**1.2**	**1.5**	**2.5**	**2.8**	**3.6**	**5.5**	**8.3**	**0.6**	**0.9**	**1.1**	**1.4**	**2.1**	**2.7**	**4.4**	**6.6**
	Q max.	kW	75	98	121	202	231	288	460	691	75	98	121	202	231	288	460	691
	V̇ secondary	**m³/h**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**	**6.5**	**8.5**	**10.5**	**17.5**	**20.0**	**25.0**	**40.0**	**60.0**

Dimensions

TransTherm pro S type (A-C)
(Dimensions in mm)



1 Flow secondary
2 Return secondary
3 Flow primary
4 Return primary

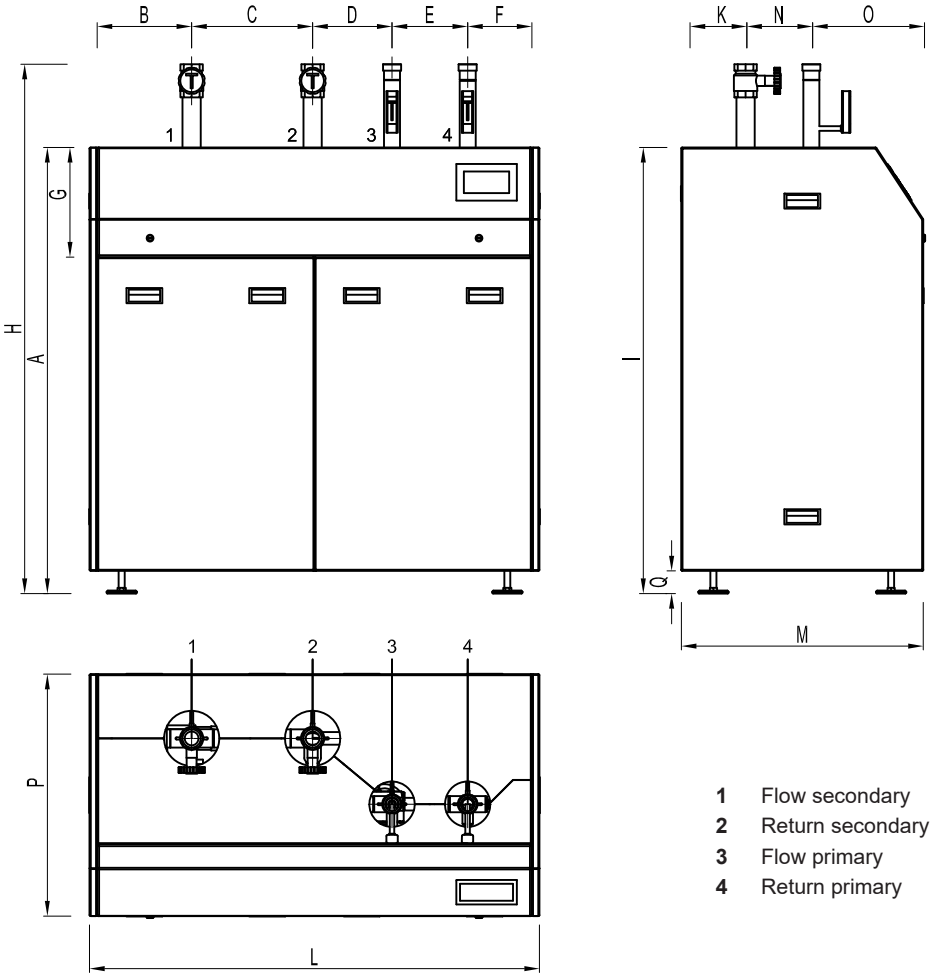
TransTherm pro S	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q
(A-C)	1180	250	320	210	200	170	290	1400	1160	150	1150	620	174	296	620	60

Allocation of heat meters

TransTherm pro S/RS	Heat meter qp	Installation length
(A, B, C)	3.5	260 mm/R 1¼"
(A, B, C)	6.0	260 mm/R 1¼"

Dimensions

TransTherm pro RS type (A-C)
(Dimensions in mm)

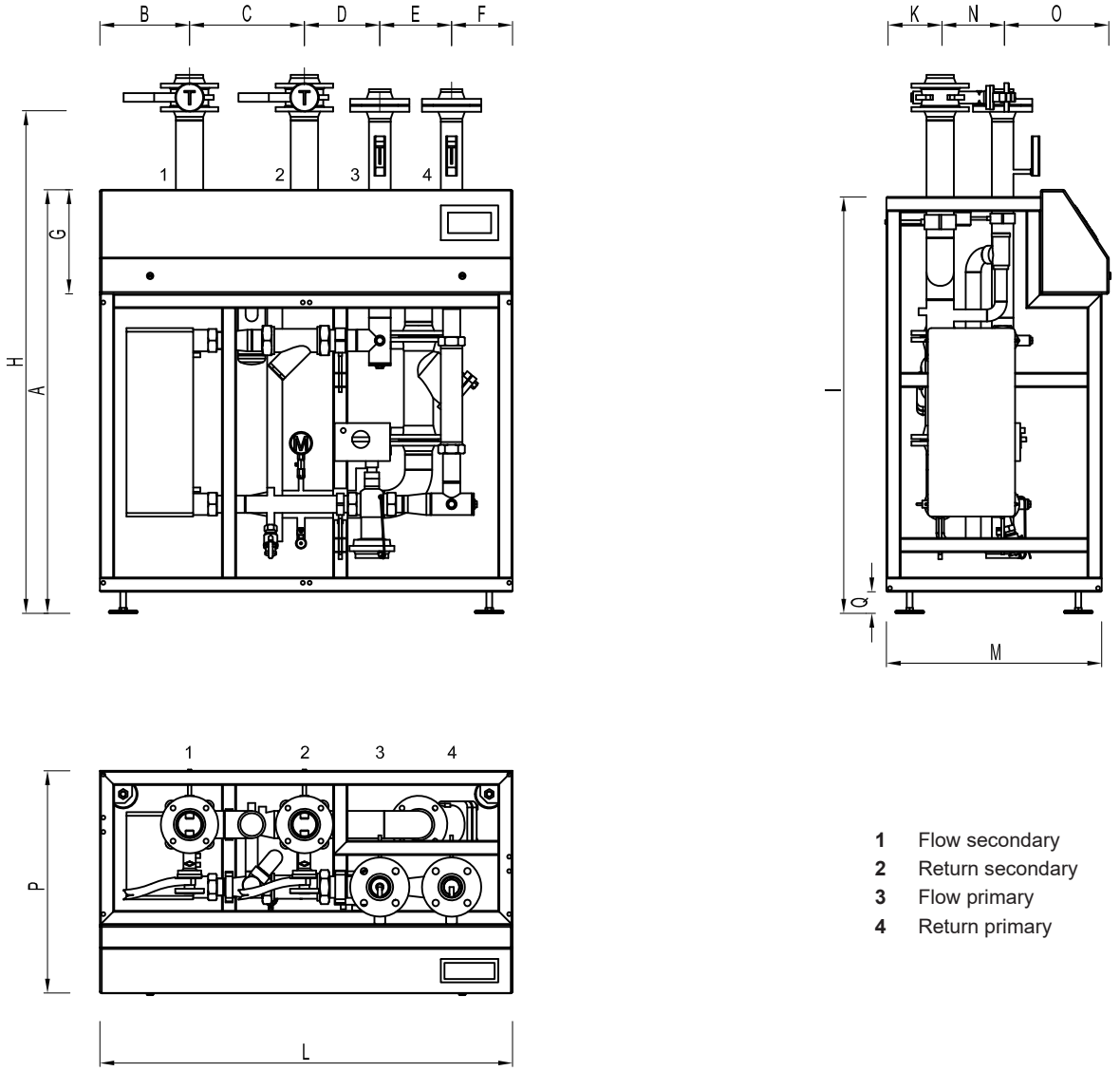


1 Flow secondary
2 Return secondary
3 Flow primary
4 Return primary

TransTherm pro RS	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q
(A-C)	1180	270	320	210	200	190	290	1400	1180	170	1190	640	174	296	640	60

Dimensions

TransTherm pro S type (D)
(Dimensions in mm)



1 Flow secondary
2 Return secondary
3 Flow primary
4 Return primary

TransTherm pro S	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q
(D)	1180	250	320	210	200	170	290	1500	1160	150	1150	620	174	296	620	60

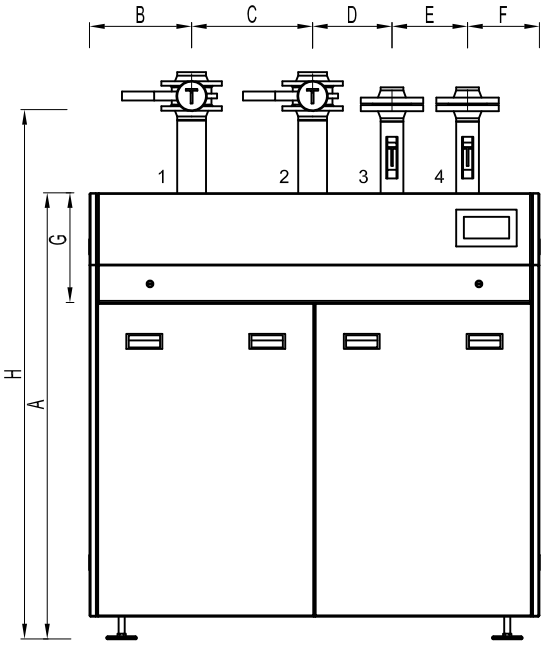
Allocation of heat meters

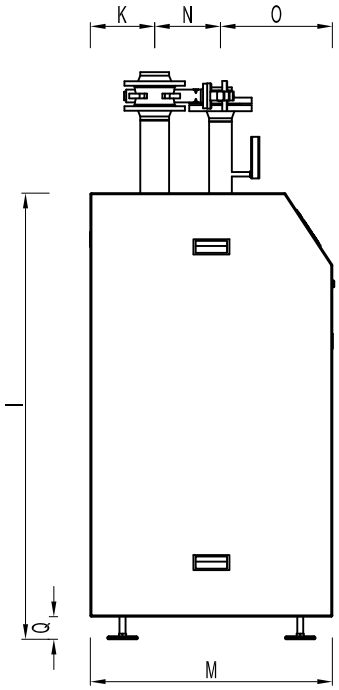
TransTherm pro S/RS	Heat meter qp	Installation length
(D)	10	300 mm/R 2″

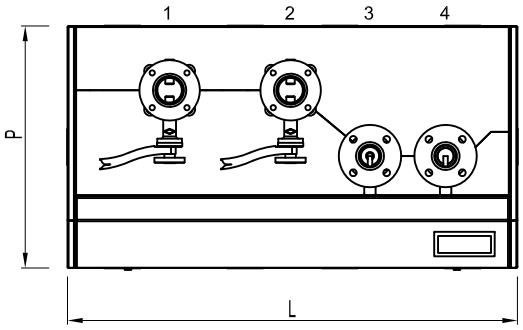
Dimensions

TransTherm pro RS type (D)

(Dimensions in mm)





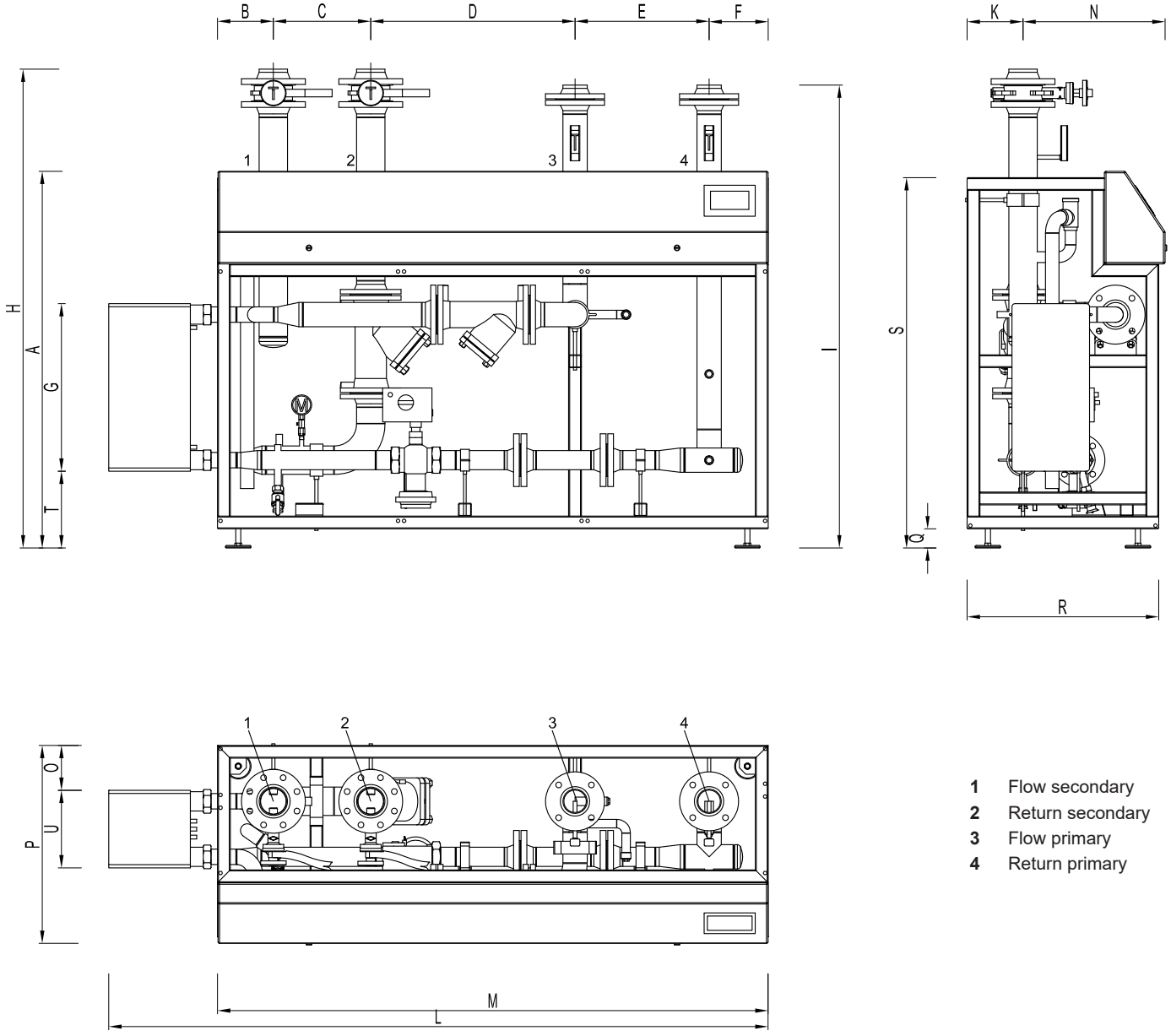


1 Flow secondary
2 Return secondary
3 Flow primary
4 Return primary

TransTherm pro RS	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q
(D)	1180	270	320	210	200	190	290	1500	1180	170	1190	640	174	296	640	60

Dimensions

TransTherm pro S type (E-G)
(Dimensions in mm)



1 Flow secondary
2 Return secondary
3 Flow primary
4 Return primary

TransTherm pro S	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U
(E)	1180	175	305	640	420	185	525	1500	1450	175	2066	1725	445	141	620	60	600	1160	241	243
(F)	1180	175	305	640	420	185	525	1500	1450	175	2275	1725	445	141	620	60	600	1160	241	243
(G)	1180	175	305	640	420	185	525	1500	1450	175	2320	1725	445	128	620	60	600	1160	241	243

Allocation of heat meters

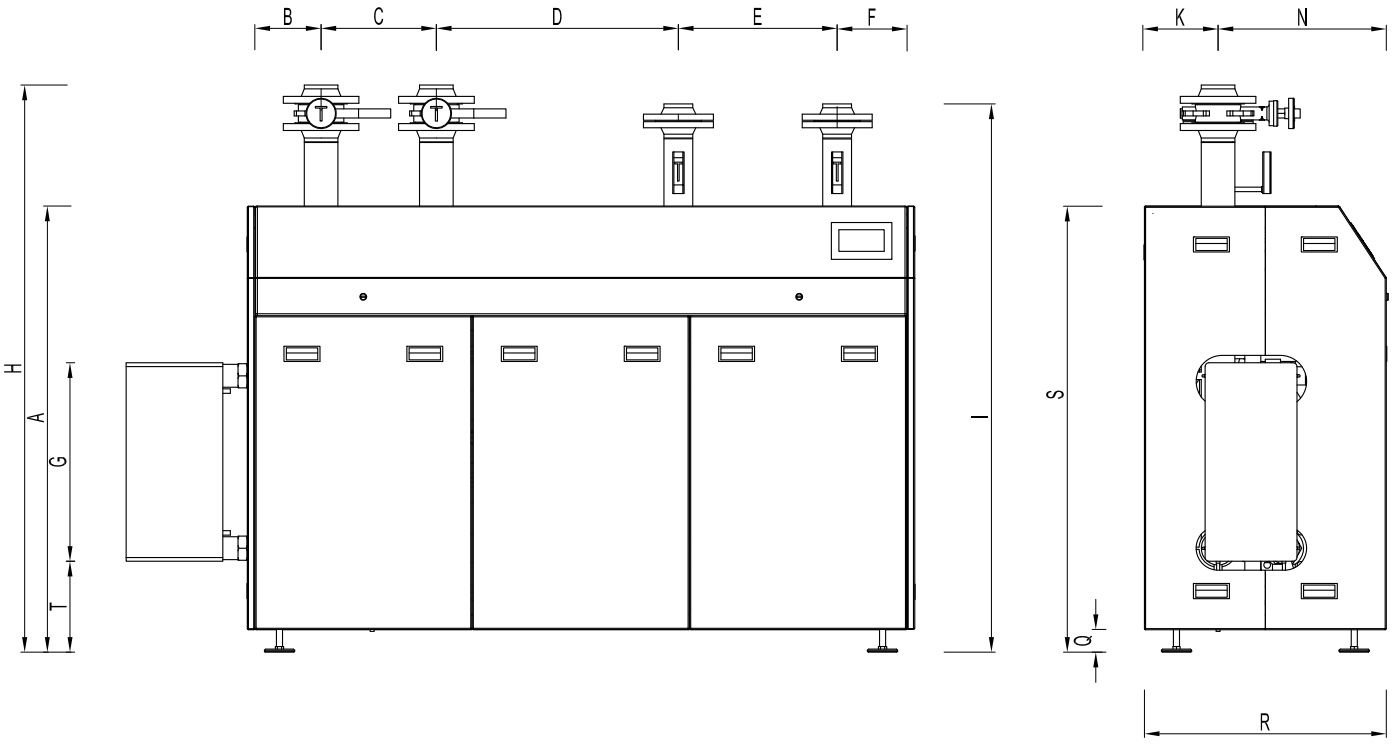
TransTherm pro S/RS	Heat meter qp	Installation length
(E, F)	15	270 mm/DN 50 FL
(G)	25	300 mm/DN 65 FL
(H)	40	300 mm/DN 80 FL

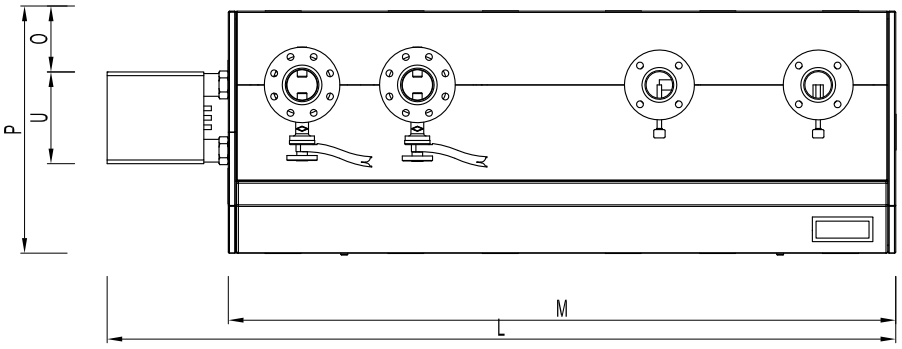
TransTherm pro S type (H)
on request

Dimensions

TransTherm pro RS type (E-G)

(Dimensions in mm)



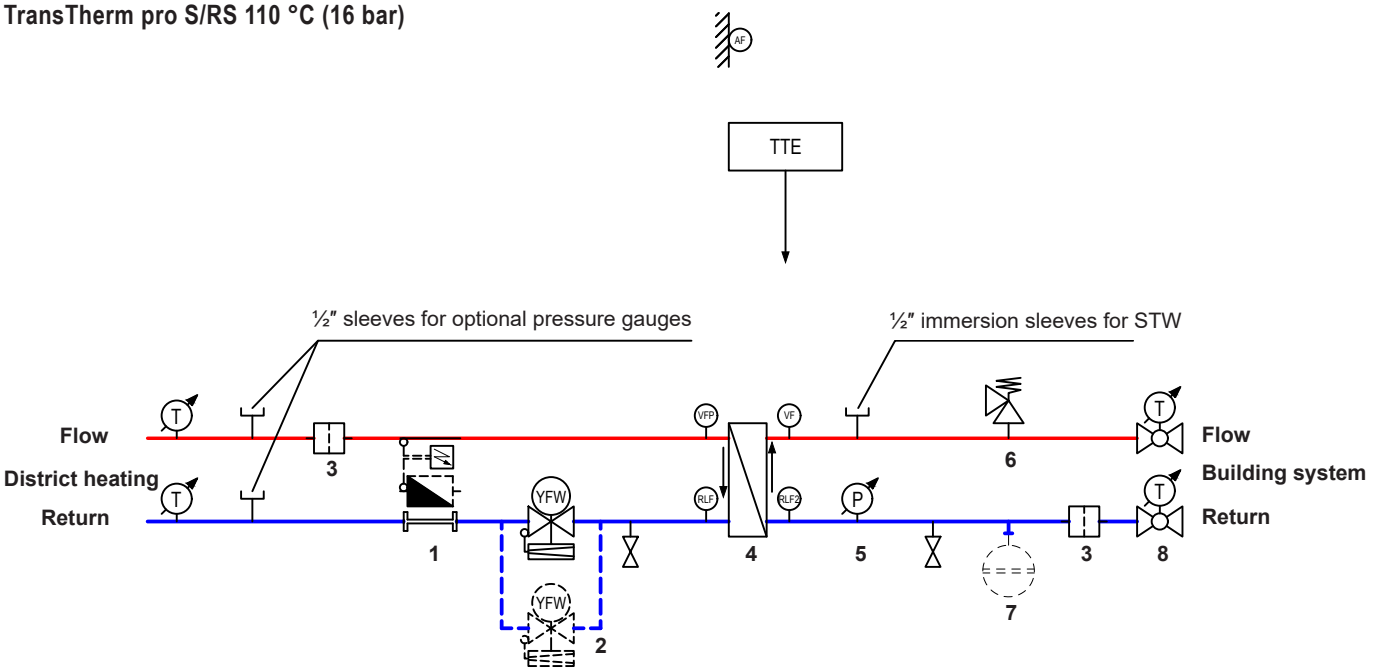


1 Flow secondary
2 Return secondary
3 Flow primary
4 Return primary

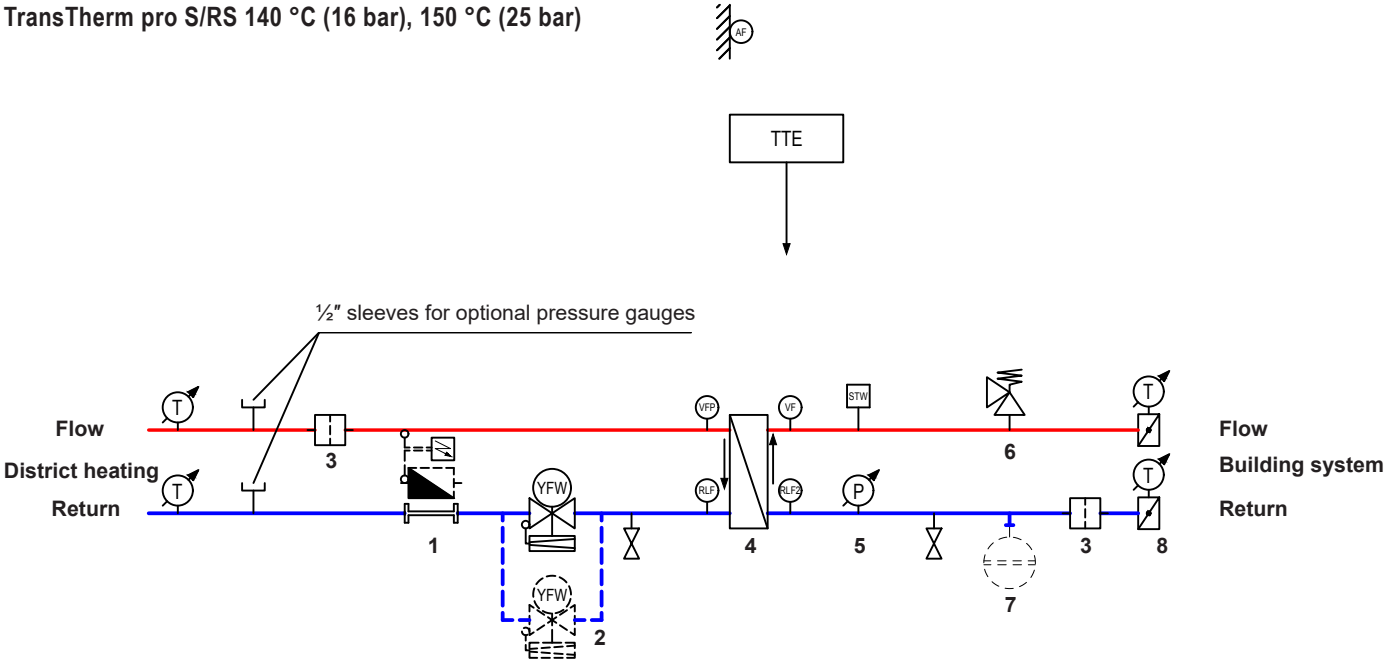
TransTherm pro RS	A	B	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U
(E)	1180	195	305	640	420	205	525	1500	1450	195	2086	1765	445	161	640	60	640	1180	241	243
(F)	1180	195	305	640	420	205	525	1500	1450	195	2295	1765	445	161	640	60	640	1180	241	243
(G)	1180	195	305	640	420	205	525	1500	1450	195	2340	1765	445	148	640	60	640	1180	241	243

Examples

TransTherm pro S/RS 110 °C (16 bar)



TransTherm pro S/RS 140 °C (16 bar), 150 °C (25 bar)



1 Heat meter adapter (heat meter optional)
2 Volume flow controller with motorised control valve (for types F and G, sequential circuit with 2 valves)
3 Strainer
4 Heat exchanger
5 Pressure gauge
6 Safety valve
7 Expansion connection (expansion tank optionally)
8 Shut-off valve with thermometer

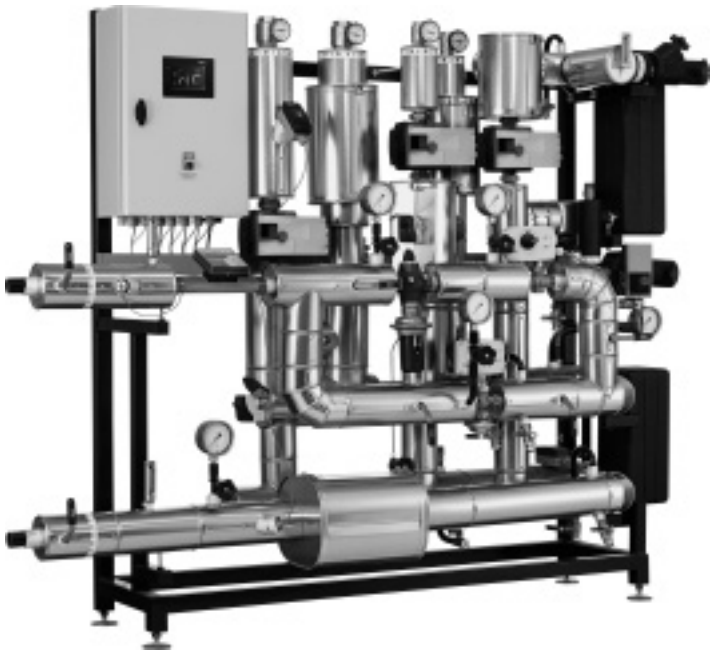
RLF Return sensor
VF Flow sensor
AF Outdoor sensor

Description

Hoval TransTherm pro

- Indirect compact station for heat transfer and regulation of heating and hot water production systems.
- For connection to district heating networks.
- Ready-to-connect and pre-wired heating groups are integrated as required.
- Various products and systems are available for hot water production.
- The TransTherm pro district heating station is designed and manufactured on a project-specific basis. The design is adapted to local conditions (installation/set-up). The technical requirements and conditions imposed by the heat supply company are implemented individually during planning and production.
- Operating pressure up to PN 40, operating temperatures of up to 200 °C can be realised.
- In the case of connection to steam networks, maximum operating temperatures of up to 350 °C are possible.
- All configurations and connection options are implemented.
- Multi-section construction in modular design for difficult on-site installation conditions is possible.
- The TransTherm pro district heating station is of fully welded design, mounted vibration-free on a free-standing or wall installation frame and equipped with special corrosion protection.
- All electrical components are pre-wired and ready-to-connect.
- In the case of multi-frame design, the electrical wiring is optimised for minimum connection effort.

Design on request
- Project-based 3D design drawings as a planning aid and for visualisation in case of order
- Tube bundle heat exchangers
- Hoval control system
- District heating station for direct connection

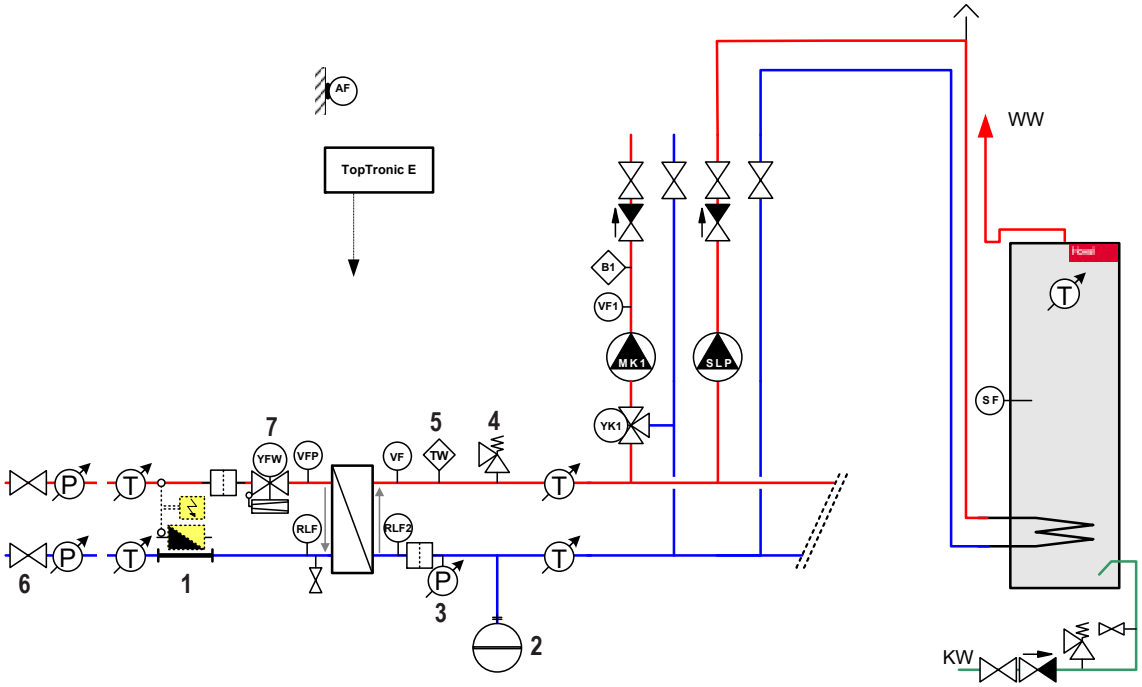


Hoval TransTherm pro

Heat output 10-15000 kW

Examples

Hoval TransTherm pro
District heating station
- Heating groups, number and size project-based



Notice:
- The example schematics merely show the basic principle and do not contain all information required for installation. The installation must be done according to local conditions, dimensioning and regulations.
- With underfloor heating a flow temperature monitor must be built in.
- Shut-off devices to the safety valve (pressurised expansion tank, safety valve, etc.) are to safe against unintended closing!
- Mount bags to prevent single pipe gravity circulation!

1 Heat meter adapter
2 Pressure expansion tank (option)
3 Pressure gauge
4 Safety valve
5 Temperature monitor
6 Shut-off valve
7 Volume flow controller with motorised control valve

RLF Return sensor
RLF2 Return sensor (secondary)
VFP Flow sensor (primary)
VF Flow sensor (secondary)
AF Outdoor sensor
SF Calorifier sensor
TW Temperature monitor

Engineering

General

District heating is thermal energy which is provided centrally and distributed over large areas with the help of a heat transfer medium and a pipe system.
Hot water or water vapour are usually used as the heat transfer medium.
Typically, district heating systems supply entire boroughs, towns or regions from one or just a few powerful heat sources. A further characteristic of this system is that as a rule, the owner of the heat sources and the distribution networks is not the owner of the buildings which are supplied with heat.

District heating is mainly generated in cogeneration heating plants. The exploitation of heat gains from nuclear power plants or industrial processes, for example waste incineration, is also a significant factor.
A special type of heat gain exploitation is the so-called “cold” district heating e.g. from waste water purification plants. The lukewarm purified waste water is fed via a transmission line to a central local heating supply plant, where it serves as a heat source with which a heat pump can be operated at a relatively high COP.

Heat transport from the heat source to the consumers is effected via the district heating distribution network.

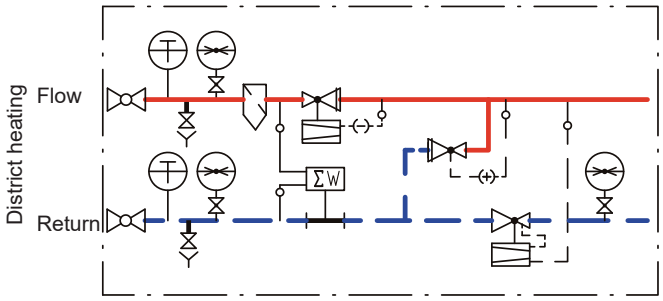
Schematic diagram of district heating energy

District heating transfer station

The district heating transfer station is the link between the district heating network and the building system. There are two basic connection types, direct and indirect connection.

Direct connection

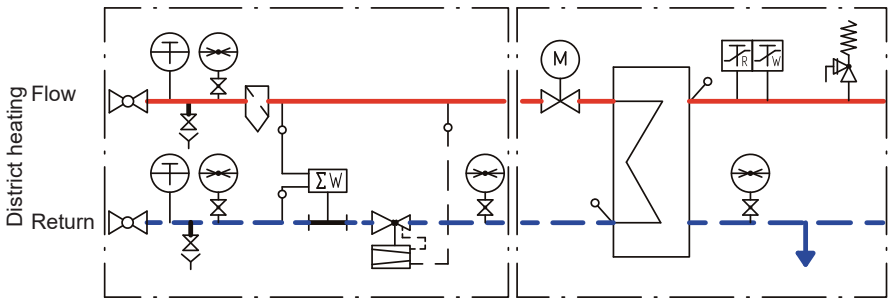
In the case of direct connection, district heating water flows straight through the building system.
This connection type is desirable where hydraulic separation of the primary and secondary circuits is not required and the pressure fluctuations in the distribution network are manageable. It is mainly used in local heating supply systems with radial networks.



District heating connection with a transfer station for direct connections

Indirect connection

In the case of an indirect connection, there is full hydraulic separation of the district heating network and the building system by means of a heat exchanger. This means that the district heating network and the building system are also independent with respect to pressure, which can be advantageous for the configuration and operation of the distribution networks. The configuration standard of the district heating station depends on the requirements of the network operators and customers.



District heating connection with a transfer station for indirect connections

Engineering

Space for district heating station
- It must be possible for the district heating provider to access the district heating station at any time.
- The district heating station should be installed in a lockable room.
- The size of the room must be sufficient for all parts of the system to be operated without problems.
- The space requirement for the district heating station must be provided in accordance with the specifications of the district heating provider.
- If no heat is taken from the district heating network, the space housing the district heating station and the parts of the district heat supply system must be kept frost-free.
- Sufficient ventilation must be provided.
- A 230 V socket must be available for measuring equipment.

District heating connection
- The district heating distribution network is a closed system.
- The heat is supplied through the circulation of heating water as a heat transfer medium from the flow line, whereby the water is routed back into the return line of the district heating provider after flowing through the customer's heat exchanger, indirect connection, or with direct connection, fully and cooled.
- The quality of the district heating water must not be changed in the heating system.

Heat quantity measurement
- A heat meter must be installed in the district heating connection.
- Hoval district heating stations are delivered with an adapter installed; this is replaced with the heat meter during commissioning.
- The measuring equipment is used to ensure that heat is delivered to the heating system correctly, and to measure the associated heat usage.
- The district heating provider must be consulted with regard to the method for measuring the heat quantity and the associated electrical installations used.

Volume flow controller with motorised control valve
- The maximum volume of water required on the basis of the ordered district heating power is set at the primary valve (combination valve).
- If this equipment is used in combination with the actuator, the temperature can also be controlled.

Differential pressure regulator
The differential pressure regulator is set by the district heating provider so that the required differential pressure for the domestic installation is available at the property boundary.

District heating flow/return temperatures
- The following operating modes are used to regulate the flow temperature: continuously controlled; constant; or constant/continuously controlled.
- The primary maximum return temperature is specified by the district heating provider. It is limited in the return flow by means of a sensor.
- For economical operation of the district heating network, the temperature difference in the system must be as great as possible.

Temperature difference ratio
- The return temperature difference of the heat exchanger is the difference in temperature between the primary and secondary return temperatures and is specified by the district heating network operator.
- If the temperature difference is reduced, the district heating return temperature drops.

Pressure levels
The following pressure levels are stipulated by the responsible district heating providers:
- Nominal pressure (dimensioning)
- Test pressure
- Maximum pressure drop of district heating station
- Closing pressure of primary control valve (in the event of a fault or power failure)

Heat output of the district heating station
- The heat output is based on:
  - The overall heat balance for the various heat consumers, taking simultaneous use into account.
  - The primary-side temperature difference between the heat exchanger, with a minimum outside temperature taken as a basis, and the maximum flow water volume required.
- The flow water volume must be calculated for summer and winter and DHW heating. The worst-case scenario determines the effective heat output of the district heating station (different operating temperatures!).

DHW heating
- Possible differences in summer and winter operating temperatures for the district heating station must be taken into consideration in the case of DHW heating.
- The entire district heating water volume is available to the priority circuit for DHW heating. This results in short heating-up times for the storage volume.
- Calorifier and heat exchanger combinations must be dimensioned so that the temperature difference of the service water heat exchanger is as low as possible and the return temperature of the secondary circuit is lower than 30 °C when heating-up begins.
- The heat output and storage volume must be coordinated in such a way that, particularly at the end of heating-up operation, the maximum primary return temperature and the difference in temperature of the district heating station are not exceeded.
- An anti-legionella circuit for thermal disinfection of a DHW heating system by exceeding the return temperature limit for restricted periods of time must be agreed on with the district heating provider.
- DHW circulation must not influence the stratification in the storage tank.
- For selection of the calorifier, see Calorifiers

Control
- The primary valve controls the secondary flow temperature in accordance with the outside air temperature. (An exception is made where there is a constant requirement.)
- The control valve must be designed so that it executes optimum control. This is ensured if the valve authority is perfectly matched to the district heat exchanger.
- The most stable control ratios are produced when

$$pv = \frac{\Delta pValve}{\Delta pValve + \Delta p\ Heat\ Exchanger} \geq 0.5$$

- When dimensioning the control valve, it is also vital to ensure that no impermissible noises occur
- To avoid pressure surges, the control valve must automatically seal shut in the event of a power failure. To this end, the valve must be configured with a minimum closing pressure specified by the district heating provider.
- Controlling the primary water flow by means of multiple hydraulic actuators connected in parallel can increase control accuracy in light-load operation.
- Adjustment should behave in a stable manner and must not be susceptible to vibrations.
- The heating system must be protected against excess temperatures

Impermissible hydraulic circuits
- Consumers must not be directly connected to the primary circuit.
- Connections on the primary side between flow and return (bypass) are forbidden.
- Water must never be fed from the heating flow directly into the heating return on the secondary side (heating system) (e.g. no bypass/injection systems/short circuit at heating distributors and ventilation groups).
- The hydraulic system must be approved by the district heating provider.

Installation of the district heating station
- Hoval district heating transfer stations are delivered fully cased and wired ready for electrical connection.
- Electrical connection of district heating station, mains connection 1 x 230 V, 50 Hz or according to wiring diagram
- The lines must be positioned so that the front door can still be fully opened.
- A heat meter must be installed upstream of the district heating station.
- The district heating connection must be dimensioned in accordance with standard engineering practice and taking into account the technical and general conditions imposed by the district heating provider, in particular with regard to temperature, pressure and different operating states in summer/winter.
- When connecting Hoval district heating stations, we recommend installing an expandable bracket immediately after the connection in order to prevent force being exerted on the heat exchanger unnecessarily as a result of thermal expansion.
- Work on components of the district heating network system may only be performed by installation technicians with the requisite training. (e.g. x-ray-proof welding)

Engineering

Pipes and fittings
Attention must be paid to the selection of the correct materials for the system components with respect to pressure and temperature.

Commissioning
- The installer must inform the district heating provider when the system is complete.
- Commissioning is carried out as agreed between the district heating provider, the installation company and Hoval.
- Work done by district heating provider:
  - Commissioning of the district heating circuit if the adjustment system is electrically wired and the system is operational.
  - Installation of the heat metering equipment (hot water meter, temperature sensor and calculation unit)
  - Filling of the system with district heating water

Adjustment
- The installation company is under obligation to adjust the heating system immediately following commissioning so that low return temperatures are maintained for each heating group or main return.
- The heating system is deemed to be adjusted for the district heating supply if, at the time of acceptance, the measured return temperatures and the temperature difference correspond to those on the installation display.

Secondary heating system
- The entry of gas or air into the heating system must be avoided.
- Low operating temperatures must be a priority.

Safety equipment
- Safety components must be provided and installed in compliance with the valid regulations and directives.

Expansion tank/expansion
- The pressure expansion tank must be connected to the separate connections of the Hoval district heating station using a detachable or sealable actuation device. This means that it is not necessary to drain the entire system in order to carry out work on the tank.

Water quality of the heating water:
- The requirements of European standard EN 14868 and VDI 2035 or SIA 384/1:2009 must be met. In particular, the following specifications must be complied with:
- Hoval district heating stations are suitable for heating systems without significant oxygen intake (system type I in accordance with EN 14868).
- Treated heating water must be tested at least 1x per year, or more frequently if prescribed by the manufacturer of the inhibitor.
- On existing systems (for example if the heat generator is replaced), where the quality of the existing heating water meets the requirements of VDI 2035, re-filling of the system is not recommended. The requirements of VDI 2035 also apply to replacement water.
- Before filling new systems and, where necessary, existing systems, the heating system must be professionally cleaned and flushed. The district heating station must not be filled until the heating system has been flushed.
- The pH-value of the heating water should be between 8.3 and 9.5 after 6 to 12 weeks of heating operation.

Filling and replacement water:
- As a rule, untreated mains water is best suited as filling and replacement water for a system with Hoval district heating stations. However, the quality of the untreated mains water must still meet the requirements of VDI 2035 or be demineralised and/or treated with inhibitors. The requirements of EN 14868 must be met in this context.

Requirements and directives
The following requirements and directives must be complied with:
- Technical information and installation instructions from Hoval.
- Technical and general conditions specified by the respective district heating provider.
- Hydraulic regulations and those pertaining to instrumentation and control, local fire prevention authority regulations and country-specific regulations
- SWKI 91-1 guidelines on boiler room ventilation
- SWKI 93-1 guidelines “Safety engineering installations for heating systems”
- Corrosion by halogenated hydrocarbons
- Corrosion damage by oxygen in heating systems
- Corrosion damage in the heating water
- Directive on water quality and water treatment in heating systems

Observe the following
under Calorifiers
Engineering hot water
Water quality
Hoval engineering guideline - water quality of the plant water on the heating side and the tap water on the domestic water side with the use of copper-soldered plate heat exchangers.

Page

Description

Hoval PowerBloc EG
Hoval PowerBloc FG

The PowerBloc EG (12-20) and FG (12-20) is assembled ready for operation at the factory and equipped as follows as standard:

- Compact and powder-coated substructure in 3-chamber system for fresh oil tank, acoustic insulation and fresh air supply as well as space for machine unit with three anti-vibration elements
- Electronically controlled industrial engine from Volkswagen, 4-cylinder, 2.0 l
- Water-cooled asynchronous generator in completely encapsulated design with vibration decoupling for generating electricity in operation parallel with the mains
- Condensing heat exchanger in compact design made of aluminium/silicone casting, comprising a water-cooled chamber system. This system contributes to high thermal efficiency
- Plate heat exchanger (soldered), pressure-resistant up to 25 bar, temperature-resistant up to 185 degrees Celsius
- Exhaust mixing pipe, manufactured using the high-grade aluminium sand-casting process with integrated slot for the closing flap and mixture preparation
- Catalytic converter technology in the form of a three-way catalytic converter, oxidation-resistant, controls the air-fuel ratio in conjunction with lambda control incl. probe downstream of catalytic converter, pollutant emissions < TA Luft 2002 (German Technical Instructions on Air Quality Control), results in very low pollutant emissions, primary coolant circuit system with integrated pressure monitoring
- Exhaust emission
  NO_x < 40 mg/Nm³
  CO < 100 mg/Nm³
- Automatic oil change/refilling function, consisting of an oil pump group and fresh and used oil tanks
- Safety device with filling equipment, pressure-resistant up to 1.5 bar
- Heat extraction consisting of pump group, flow and return, and integrated temperature displays, speed-controlled pump
- Easy-to-remove thermoacoustic housing, rust-resistant and powder-coated, with 50 mm insulation fleece. (Sound pressure level < approx. 50 dB(A) at a distance of 1 m)
- Gas control line with electronic actuator and zero pressure regulator (biogas/sewage gas only)
- Condensate system with drain device, suitable for DN 80/125 PPs exhaust system
- Actively vented control panel with PowerBloc control system, powder-coated and with cushioned lifting device for inexpensive maintenance
- PowerBloc control system complete with output section and 3-pole soft-starter; user-friendly and clearly laid out with multilingual touchscreen display; main switch on/off, assembled ready for operation with all standard modules incl. network and system protection in accordance with VDE-AR-N 4105
- User manual with installation instructions

Model range	Output	
PowerBloc EG and FG	Electrical	Thermal
Type	kW	kW
(12)	12	30
(15)	15	34
A++ (20)	20	43

- Communication system
  Communication modem with operating system for remote maintenance and cyclic data acquisition via WebUI incl. data notification via e-mail and SMS as well as integrated firewall. Warning upon detection of faults and connection failure through cyclical commands incl. history, diag. tool, parameterisation, evaluation, user management, site management, notification groups, etc. incl. UBS Ethernet adapter. Readout is performed via Modbus TCP.
- Flexible connections
  - Vibration and solid-borne noise decoupling 2x heat extraction hoses
  - 1x fuel hose (delivery, installation on site)
- Our PowerBloc controller is equipped with a remote monitoring system via the Internet. The remote monitoring system can be individually adapted depending on the available communication network.
- The infinitely adjustable electrical output from 25 - 100 % offered by the PowerBloc combined heat and power plants can be both manually and automatically adapted to meet individual energy requirements. In particular, the heat demand can be adapted to the seasonal variations, thereby guaranteeing low standstill times with optimum electricity yield, and also offering ease of maintenance.
- The CHP plants are assembled ready for operation and are subject to a thorough test (approx. 30 hours) prior to delivery. After the test run has been completed successfully, there is a final inspection including a acceptance report. Depending on the local conditions of the customer, our combined heat and power plants can then be dismantled into smaller subassemblies, then assembled and filled at the customer's premises.
- All of the following performance and efficiency information is based on a return temperature of 35 °C, the use of optional equipment and natural gas operation (calorific value Hi = 8.8 kWh/m³ under normal conditions). The values relate to a relative air humidity of 30 %, an air pressure of 1013.25 mbar, a room temperature of 30 °C at a room height of 1.5 m and an intake air temperature of 25 °C. Deviations are possible if there is a different gas quality and other air values.
- The technical data is listed for standard reference conditions in accordance with ISO 3046-1 (DIN 6271) with a tolerance of ± 5 %.

Design on request

- Design for biogas operation
- Emergency cooler
- Low-frequency silencer (2nd exhaust gas silencer)
- Gas warning system
- Gas pressure booster
- Containerised version for weatherproof outdoor installation
- Unloading of the CHP plant and transport to the installation site
- Plant-specific control and remote monitoring systems
- Peak load boiler, e.g. oil or gas
- System solutions and combinations with further Hoval products for plant optimisation
- Consulting and planning support for engineering and configuration
- Comprehensive service and maintenance concepts.

Delivery

- Compact, pre-assembled consignment

On site

- Connection installation for heating, gas, exhaust gas line and electricity, as well as supply and exhaust gas

Description

Electrical control panel
With CHP plant regulation and control systems integrated. Included:

PowerBloc controller
- The controller is responsible for the correct function of the CHP plant and carries out all important control and monitoring functions, such as on the gas line, modulation, auxiliary systems and operation in parallel with the mains. Ultimately, it contains the intelligence for the plant and allows adjustments for economical operation to be made.
- The control has a 7″ touch panel that enables you to navigate through the menu structure intuitively. The main screen provides a quick source of information about the system status, energy values as well as an overview of the history. Furthermore, it is the starting point for accessing the settings (e.g. output characteristic, schedule, time and date, LAN address, e-mail and additional functions such as intelligent cascade control or binary outputs) and additional information.

Base group with frame
- The base group consists of a torsionally rigid steel section design for housing the engine, generator, electrical cabinet and coolant heat exchanger. The base frame is equipped with corresponding openings for transport with a forklift or lift truck.
- The engine/generator unit is flexibly mounted on the base frame by means of rubber-metal pads which have been calculated so as to provide the necessary cushioning. The pads are secured with wooden wedges at the factory. This transport protection must be removed before initial commissioning.

Driveline
- The driveline consists of the gas-fuelled internal combustion engine and the generator. Power is transmitted between these two components via a rigid disc coupling. A flange is connected to the combustion engine on one side and the generator on the other. The flange is attached to the base group in a flexible arrangement via the unit carrier and with damping elements.

Gas engine
- The gas engine is a 4-stroke internal combustion engine operating according to the Otto process, with $\lambda = 1$. The mixture is ignited with electronic control by means of external ignition with spark plugs. The exhaust gas is purified by a three-way catalytic converter.

Generator
- A water-cooled asynchronous generator is used in the CHP plant. This three-phase generator functions as a motor for starting up the internal combustion engine. Following start-up, the generator generates three-phase current. The water is cooled by the heating water.

Lubricating oil supply
- The engine is lubricated by means of forced-feed lubrication. The lubricating oil is cleaned by an oil filter cartridge in the main flow. The oil level is monitored by liquid level switches. It can also be checked visually at the level indicator.
- Replenishment of the lubricating oil is ensured by an external, electrical diaphragm pump. This pump pumps oil into the engine oil circuit from the oil reservoir tank when required, ensuring a constant volume of oil. The fresh oil and old oil pumps perform the fully automatic oil change, ensuring an optimum supply of fresh oil at all times.

Gas line
- The gas is supplied by means of a modular safety gas line. All components of the gas line are approved in accordance with the DVGW (the German Technical and Scientific Association for Gas and Water). The gas line is permanently mounted. The gas is mixed with the combustion air in the gas/air mixer.

Heat exchanger system
- The heat exchanger system consists of several components which absorb heat at several points in the overall system and dissipate it again elsewhere. The main components are the exhaust gas heat exchanger, plate heat exchanger, the exhaust manifold, the engine coolant heat exchanger as well as the internal engine cooling water pump and the heating water pump.
- The exhaust gas heat exchanger has been specially designed for transmitting heat from the exhaust gases of the gas engine to the heating water circuit. The exhaust gases emerging from the catalytic converter flow through the cooling ribs and dissipate heat to the heating water. The exhaust gas heat exchanger is designed as an aluminium casting. The plate heat exchanger transmits the heat from the engine coolant circuit to the heating water circuit. The plate heat exchanger consists of soldered copper plates. The exhaust manifold admits the exhaust gases emerging from the engine, collects them together and directs them to the catalytic converter. Part of the heat is extracted from the exhaust gases at this stage by a water jacket that has heating water flowing through it.
- The hydraulik plan shows how the individual components are arranged in the overall system. The generator is also part of the system and is used to cool the copper winding with heating water and to extract additional heat from the system.

Power factor correction
- In order to generate the plant's electrical energy, reactive energy and the necessary reactive current are required. As these fields are established and dissipated continuously during the alternating voltage cycle, the energy continuously fluctuates between the generator and consumer. This cannot be used, i.e. converted into another form of energy, but it puts a strain on the power supply system, and under certain circumstances may be charged by the grid operator.
- By using an output capacitor directly on the plant, it is possible to reduce the load on the transmission devices because the necessary reactive power is no longer supplied by the power system but by the capacitor instead. In electrical engineering terms, as can be seen in the figure, angle f is reduced and the cosine of the angle (power factor) approaches 1. Our unit corrects approximately to a power factor of 0.95 at an output of 20 kW. The amount of reactive power drawn from the power system decreases.

Plant structure: engine
- 4-cylinder, 4-stroke VW industrial engine, grey cast iron, modified
- Optimised camshaft
- Optimised control times
- Optimised engine management
- Lambda probe upstream and downstream of catalytic converter for optimum mixture adjustment
- Compression: 1:14
- Knock control for optimised ignition point
- Water-cooled exhaust manifold made from aluminium casting
- Condensing heat exchanger with integrated 3-way catalytic converter
- Oversized plate heat exchanger for engine coolant

Plant structure: heat extraction
- Flow directly through generator / exhaust manifold / condensing heat exchanger
- Engine connected in parallel via plate heat exchanger
- Flow rate from 0.5 to 5 m³/h
- Inlet temperature 0 to 75 °C / optionally up to 87 °C at full load
- Outlet temperature up to 95°C
- Optional constant outlet temperature up to 95 °C
- Sludge filter in inlet recommended

Plant structure: PowerBloc controller
- Freely programmable PLC with 7″ touch panel
- Soft starter via star-delta starter (I < 60 A)
- Practical control panel structure – quick troubleshooting
- Incl. fixed compensation
- Incl. MID three-phase meter
- Incl. Modbus interface and Modbus coil for DDC tasks
- 4 binary outputs for DDC messages
- External output specifications / 0 - 20 mA / ripple control signal
- Plain text displays / menu navigation
- Can be folded up for servicing

Connection/installation
- 1″ hose set for flow and return
- ¾″ hose for gas connection
- RLA / RLU PPS DN 80 pipe, preferably dependent on room air
- Condensate trap in scope of delivery
- Absorption and reflection silencers available
- 5 x 16 mm² electrical connection up to 20 m
- LAN connection or GSM router for remote monitoring system
- Internal network and system protection (for cascades, centralised network and system protection necessary)
- Equipotential bonding
- Combustion supply air / no housing ventilation

Notice
If not stated otherwise, all technical data refers to full-load engine operation.

Part No.

CHP plant Hoval PowerBloc	Part No.
PowerBloc EG (Natural gas)	
Type	
(12)	8007 730
(15)	8007 731
A++ (20)	8005 758
A++ (20) for cascades (without network and system protection)	8005 757
PowerBloc FG (Liquid gas)	
Type	
(12)	8007 741
(15)	8007 742
A++ (20)	8006 654
A++ (20) for cascades (without network and system protection)	8006 653

Low-frequency silencer (S-080) (PP) 7013 913
for (12-20) and FG (12-20)
As flue gas silencer for further reduction of flue gas sound pressure level.
Residual sound pressure level: approx. 45 dB(A) at 10 m distance from flue gas outlet (free field).

Low-frequency silencer (G-080) (PP) 7013 916
for EG (12-20) and FG (12-20)
As flue gas silencer for further reduction of flue gas sound pressure level.
Residual sound pressure level: approx. 40 dB(A) at 10 m distance from flue gas outlet (free field).

Emergency cooling 7013 918
for EG (12-20) and FG (12-20)
For the emergency cooling circuit, the corresponding components (table cooler, pump, heat exchanger, three-way valve + actuator, BV, DEV, SV, thermometer, pressure gauge) are provided.
Installation incl. pipes, insulation, cabling done on-site acc. to hydraulic. & electrical diagrams provided.

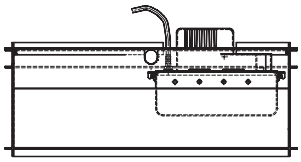
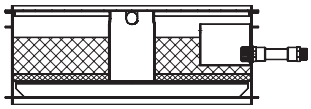
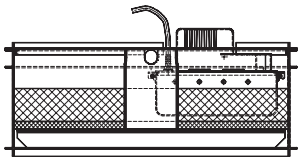
Network and system protection box
for systems with cascade connecting of several PowerBloc EG (20) and FG (20)

2x PowerBloc up to 44 kVA	2064 797
3x PowerBloc up to 78 kVA	2065 276
4x PowerBloc up to 100 kVA	2065 275

Part No.

		Part No.
	**Gas detection system** Gas measuring computer with a gas sensor and connection to the module controller. Prealarm set to 20 % LEL Main alarm set to 40 % LEL integr. relay contacts for alarm message relay contact can be acknowledged for activating a horn (optional), installation by client	7012 220
	**Smoke warning system** Smoke detector for the CHP unit room battery operation without mains power integr. acoustic warning sound integr. relay contact for alarm message to the module controller, installation by the client	7012 221
	**Oil/water warning device** Oil/water warning system with a sensor for the oil collecting tray. Connection to the module controller with safety stop. Mounting on site	7012 223
	Warning horn and light Horn and warning light in outdoor area Activation by the module controller or the gas warning system Installation by the client	7012 222
	Storage tank level control/ storage tank management For controlling a CHP plant, a storage tank charging pump, a storage tank discharge pump and and the boiler lock depending on the storage tank temperature. Switching values and times can be freely configured via control of the CHP plant. Including 4 PT1000 sensor with two-wire technology for temperature recording on the heat accumulator.	7017 556
	CO (carbon monoxide) monitor For monitoring the CO content in the room air with acoustic alarm and switch-off of the CHP plant if the permitted CO value is exceeded. Measuring range from 0 to 500 ppm RCR relay output 3A/230 Vac Voltage supply 24 Vac/Vdc Sensor lifetime 5 years Reaction time T63 = 35 s	7017 557
	M-bus interface For collecting digital data of gas and heat monitors in (kWh)	7017 558
	**Power-optimised operating mode** for preventing feeding into the public network. Performance recording and approach of controllable loads via balance point controller. Consisting of: Balance point controller HW 2.7 SW 1.36 complete with standard current transformers. Raspberry Pi top hat rail casing and matching power supply unit. USB/serial converter.	6049 942
	Extended exhaust gas purification for PowerBloc EG (12,15,20) with 5% residual oxygen Nitrous oxides (NOx) < 40 mg/m³ Carbon monoxide (CO) < 100 mg/m³	8007 897

Part No.

		Part No.
	**Condensate box KB 22** for UltraGas® (125-1150), (250D-2300D), UltraOil® (65-300), (320D-600D) For condensate drainage into higher situated drain pipe with delivery pump. Max. delivery height 3.5 m, from 1200 kW two delivery pumps necessary. Delivery rate 120 l/h incl. liquid level switch, silicone hose 9/13 mm, 4 m long, electrical cable 1.5 m with plug Use one box per boiler.	6033 767
	**Neutralisation box KB 23** for UltraGas® (125-1150), (250D-2300D), UltraOil® (65-300), (320D-600D) Condensate drainage into lower situated drain pipe without condensate delivery pump with neutralisation 12 kg neutralisation granulate Placed under the boiler Use one box per boiler.	6001 917
	**Neutralisation box KB 24** for UltraGas® (125-1150), (250D-2300D), UltraOil® (65-300), (320D-600D) for transporting condensation water into a higher lying drainage duct, max. delivery height 3.5 m, from 1200 kW two delivery pumps necessary. Delivery rate 120 l/h incl. liquid level switch, silicone hose 9/13 mm, 4 m long, electrical cable 1.5 m with plug 12 kg granulate Use one box per boiler.	6033 764
	**Neutralisation granulate** for neutralisation box Refill set volume 3 kg Life time of one filling: approx. 2-4 years; depending on amount of condensate	2028 906

Service

Check visit before commissioning	4504 656
Commissioning PowerBloc EG (12-20) and FG (12-20)	4505 443
Commissioning of further PowerBloc EG (20) and FG (20)	4505 913

Technical data

Hoval PowerBloc EG (12) and FG (12)

Type			(12)
Performance data [1]			
Electrical output [2]	modulating	kW	5-12
Thermal output	modulating, at a return temperature of 35 °C	kW	18-30
Fuel performance		kW	24-40
Electrical efficiency	at an electrical output of 12 kW	%	30.0
Thermal efficiency	at a return temperature of 35 °C	%	72.0
Total efficiency	at a return temperature of 35°C	%	102.0
Efficiency class			A^{++}
Exhaust emission [3]	at 5 % O_2	mg/Nm³	NOx <125, CO <150
Current coefficient	0.53 without condensing technology		0.41
Engine			
Manufacturer			Volkswagen
Type			Industrial engine, electronically controlled
Approx. nominal rotation speed		min^{-1}	1535
Fuel			Natural gas or liquid gas
Cylinders			4R
Cylinder capacity		dm³	2.0
Oil supply			auto. oil replenishment/change function
Oil sump capacity		l	approx. 4
Fresh oil tank capacity		l	25
Generator			
Manufacturer			EMOD
Type			asynchronous, 4-pole, water-cooled
Voltage		V	400
Current		A	42.3
Frequency		Hz	50
Heating circuit			
Max. flow temperature		°C	95
Flow connection		DN	25, 1″ int. thread
Max. return temperature		°C	80
Return connection		DN	25, 1″ int. thread
Flow rate		m³/h	1.8 bei Δt = 20 K
Max. water pressure		bar	4
Water quality			acc. to VDI 2035
Exhaust gas system			
Exhaust gas connection		DN	80, PPs type B
Max. operating temperature		°C	85
Min. temperature class		°C	120
Max. counterpressure		mbar	10, at exhaust gas system test port
Exhaust gas mass flow rate		m³/h	55.0 (at full load)
Fuel system			
Gas connection		DN	20, ¾″ ext. thread
Flow pressure		mbar	20-60
Min. methane number			60
Condensate drain			
Connection		DN	40
Electrical system			
Connections		mm²	5 x 16
Protection		A	3 x 63, type NH00
Sound pressure level			
Module noise at 1 m		dB(A)	<49, acc. to DIN 45635-01-KL2
Dimensions and weight			
Length		mm	1300
Width		mm	800
Height		mm	1300
Weight		kg	approx. 700

[1] All performance and efficiency information is based on a return temperature of 35 °C, the use of optional equipment and natural gas operation (net calorific value NCV = 8.8 kWh/m³ under normal conditions). The values relate to a relative air humidity of 30 %, an air pressure of 1013.25 mbar, a room temperature of 30 °C at a room height of 1.5 m and an intake air temperature of 25 °C. Deviations are possible if there is a different gas quality and other air values.

[2] The technical data is listed for standard reference conditions in accordance with ISO 3046-1 (DIN 6271) with a tolerance of ± 5 %.

[3] Lower emissions on request

Technical data

Hoval PowerBloc EG (15) and FG (15)

Type			(15)
Performance data [1]			
Electrical output [2]	modulating	kW	5-15
Thermal output	modulating, at a return temperature of 35 °C	kW	18-34
Fuel performance		kW	24-48
Electrical efficiency	at an electrical output of 15 kW	%	32.0
Thermal efficiency	at a return temperature of 35 °C	%	70.0
Total efficiency	at a return temperature of 35°C	%	102.0
Efficiency class			A^{++}
Exhaust emission [3]	at 5 % O_2	mg/Nm³	NOx <125, CO <150
Current coefficient	0.53 without condensing technology		0.45
Engine			
Manufacturer			Volkswagen
Type			Industrial engine, electronically controlled
Approx. nominal rotation speed		min^{-1}	1535
Fuel			Natural gas or liquid gas
Cylinders			4R
Cylinder capacity		dm³	2.0
Oil supply			auto. oil replenishment/change function
Oil sump capacity		l	approx. 4
Fresh oil tank capacity		l	25
Generator			
Manufacturer			EMOD
Type			asynchronous, 4-pole, water-cooled
Voltage		V	400
Current		A	42.3
Frequency		Hz	50
Heating circuit			
Max. flow temperature		°C	95
Flow connection		DN	25, 1″ int. thread
Max. return temperature		°C	80
Return connection		DN	25, 1″ int. thread
Flow rate		m³/h	1.8 bei ∆t = 20 K
Max. water pressure		bar	4
Water quality			acc. to VDI 2035
Exhaust gas system			
Exhaust gas connection		DN	80, PPs type B
Max. operating temperature		°C	85
Min. temperature class		°C	120
Max. counterpressure		mbar	10, at exhaust gas system test port
Exhaust gas mass flow rate		m³/h	65.5 (at full load)
Fuel system			
Gas connection		DN	20, ¾″ ext. thread
Flow pressure		mbar	20-60
Min. methane number			60
Condensate drain			
Connection		DN	40
Electrical system			
Connections		mm²	5 x 16
Protection		A	3 x 63, type NH00
Sound pressure level			
Module noise at 1 m		dB(A)	<49, acc. to DIN 45635-01-KL2
Dimensions and weight			
Length		mm	1300
Width		mm	800
Height		mm	1300
Weight		kg	approx. 700

[1] All performance and efficiency information is based on a return temperature of 35 °C, the use of optional equipment and natural gas operation (net calorific value NCV = 8.8 kWh/m³ under normal conditions). The values relate to a relative air humidity of 30 %, an air pressure of 1013.25 mbar, a room temperature of 30 °C at a room height of 1.5 m and an intake air temperature of 25 °C. Deviations are possible if there is a different gas quality and other air values.

[2] The technical data is listed for standard reference conditions in accordance with ISO 3046-1 (DIN 6271) with a tolerance of ± 5 %.

[3] Lower emissions on request

Technical data

Hoval PowerBloc EG (20) and FG (20)

Type			(20)
Performance data [1]			
Electrical output [2]	modulating	kW	5-20
Thermal output	modulating, at a return temperature of 35 °C	kW	18-42
Fuel performance		kW	24-60
Electrical efficiency	at an electrical output of 20 kW	%	33.3
Thermal efficiency	at a return temperature of 35 °C	%	70.0
Total efficiency	at a return temperature of 35°C	%	103.3
Efficiency class			A^{++}
Exhaust emission [3]	at 5 % O_2	mg/Nm³	NOx <125, CO <150
Current coefficient	0.53 without condensing technology		0.48
Engine			
Manufacturer			Volkswagen
Type			Industrial engine, electronically controlled
Approx. nominal rotation speed		min^{-1}	1535
Fuel		%	Natural gas or liquid gas
Cylinders			4R
Cylinder capacity		dm³	2.0
Oil supply			auto. oil replenishment/change function
Oil sump capacity		l	approx. 4
Fresh oil tank capacity		l	25
Generator			
Manufacturer			EMOD
Type			asynchronous, 4-pole, water-cooled
Voltage		V	400
Current		A	42.3
Frequency		Hz	50
Heating circuit			
Max. flow temperature		°C	95
Flow connection		DN	25, 1″ int. thread
Max. return temperature		°C	80
Return connection		DN	25, 1″ int. thread
Flow rate		m³/h	1.8 bei Δt = 20 K
Max. water pressure		bar	4
Water quality			acc. to VDI 2035
Exhaust gas system			
Exhaust gas connection		DN	80, PPs type B
Max. operating temperature		°C	85
Min. temperature class		°C	120
Max. counterpressure		mbar	10, at exhaust gas system test port
Exhaust gas mass flow rate		m³/h	82.5 (at full load)
Fuel system			
Gas connection		DN	20, ¾″ ext. thread
Flow pressure		mbar	20-60
Min. methane number			60
Condensate drain			
Connection		DN	40
Electrical system			
Connections		mm²	5 x 16
Protection		A	3 x 63, type NH00
Sound pressure level			
Module noise at 1 m		dB(A)	<49, acc. to DIN 45635-01-KL2
Dimensions and weight			
Length		mm	1300
Width		mm	800
Height		mm	1300
Weight		kg	approx. 700

[1] All performance and efficiency information is based on a return temperature of 35 °C, the use of optional equipment and natural gas operation (net calorific value NCV = 8.8 kWh/m³ under normal conditions). The values relate to a relative air humidity of 30 %, an air pressure of 1013.25 mbar, a room temperature of 30 °C at a room height of 1.5 m and an intake air temperature of 25 °C. Deviations are possible if there is a different gas quality and other air values.

[2] The technical data is listed for standard reference conditions in accordance with ISO 3046-1 (DIN 6271) with a tolerance of ± 5 %.

[3] Lower emissions on request

Technical data

Low-frequency silencer

for Hoval PowerBloc EG (12-20) and FG (12-20)

- Polymer version, material: PP black
- Filled with water-repellent mineral wool
- Standard EW connections
- Max. exhaust gas temperature 120 °C
- Positive-pressure-tight up to 5000 Pa
- ¾″ condensate drain
- Horizontal or vertical installation position

Type			(S-080)	(G-080)
Connection	DN	mm	80	80
Effective length	B	mm	500	1380
Outside diameter		mm	250	250
Total length	C	mm	790	1440
Nozzle length	E	mm	100	70
Total weight		kg	4.5	5.5
Drag coefficient	ζ		0.1	0.1

Emergency cooler

for Hoval PowerBloc EG (12-20) and FG (12-20)

- Installation altitude 200 metres above sea level
- Ambient temperature 35 °C
- Reserve surface area approx. 5-10 %

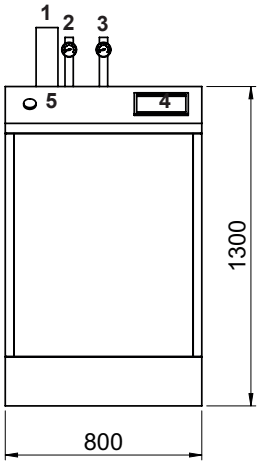
Coolers equipped with:
- Terminal box
- Flange pairs
- Foot length 600 mm

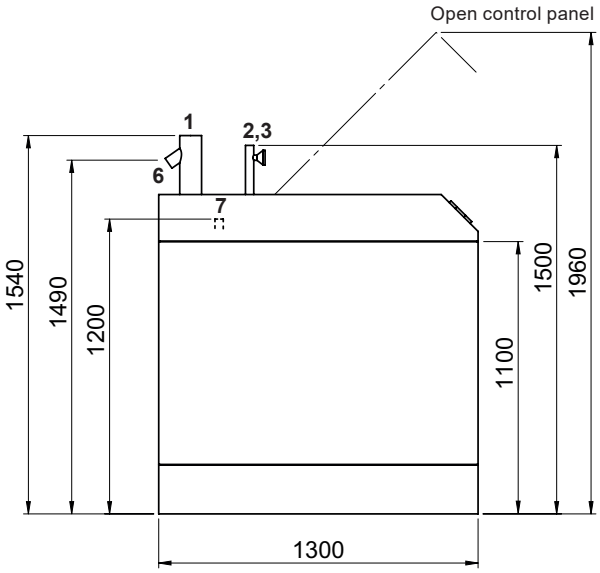
PowerBloc EG / FG		(20)
Emergency cooler		GFHC FD 050.1/11-42
Recooling power	kW	65
Ethylene glycol/water mixture		40 %-60 %
Sound pressure level at 10 m	dB(A)	42
Sound power level	dB(A)	73
Weight	kg	103

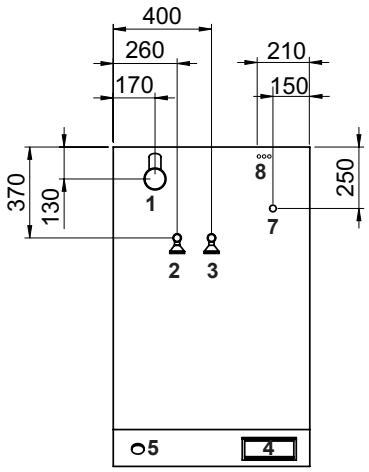
Dimensions

Hoval PowerBloc EG (12-20) and FG (12-20)

(Dimensions in mm)





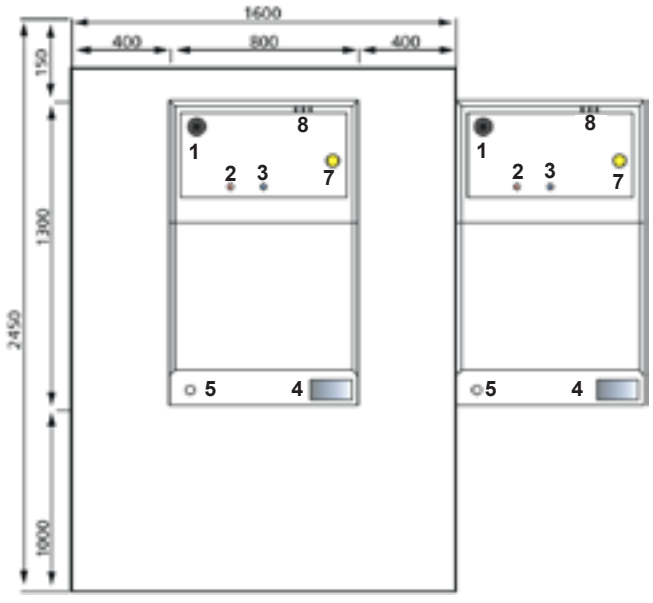


View from above

1	Exhaust gas connection	DN 80
2	Heating flow incl. shut-off valve, pressure gauge and non-return valve (1″ int. thread)	DN 25
3	Heating return incl. shut-off valve, pressure gauge and non-return valve (1″ int. thread)	DN 25
4	Operating console	
5	Main switch	
6	Condensate connection	DN 40
7	Gas connection with ¾″ connection hose, int. and ext. thread (shut-off valve on site)	DN 20
8	Elektroanschluss	

Space requirement Hoval PowerBloc EG (12-20) and FG (12-20)

(Dimensions in mm)



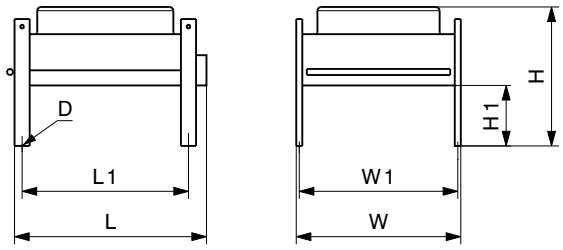
Space requirement (view from above)

Dimensions

Emergency cooler

for Hoval PowerBloc EG (12-20) and FG (12-20)

(Dimensions in mm)



PowerBloc EG/FG Type	Type	D	H	H1	L	L1	W	W1	Weight kg	Connection [1]
(12-20)	GFHC FD 050.1/11-42	13	919	400	1269	1100	1088	1048	103	28 x 1.5

[1] Mating flange PN 10 with soldering flange

Example

Hydraulic schematic PowerBloc EG (12-20) and FG (12-20)

The buffer storage tank is heated by the CHP plant. If the required system temperature can no longer be reached in the buffer storage tank, the gas boiler is put into operation.

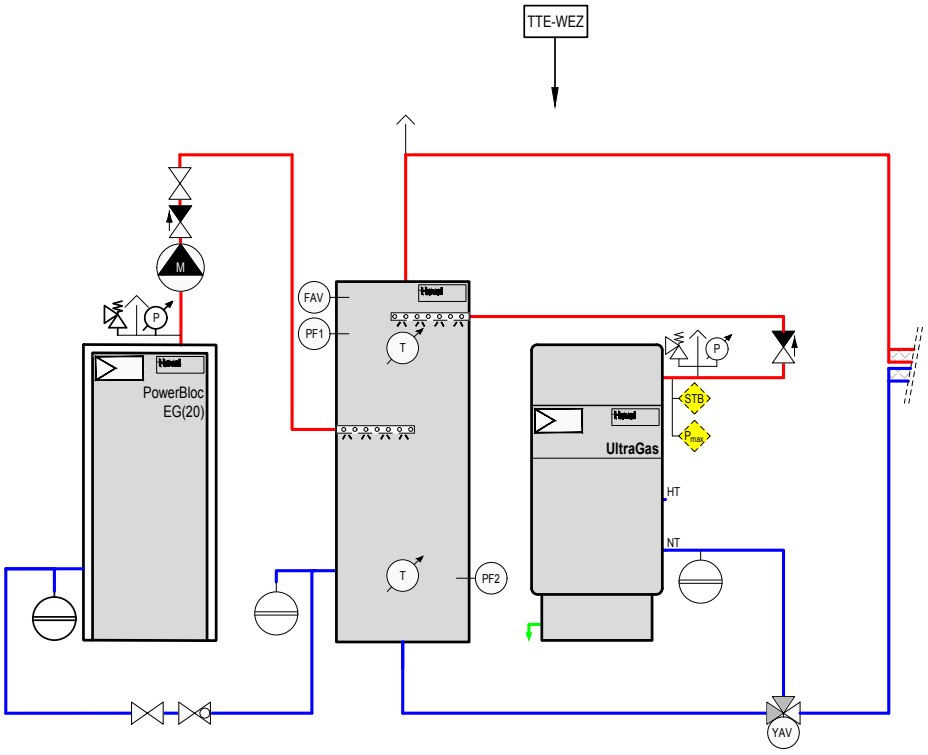
Using a plant flow sensor (FAV in the buffer storage tank) and mixer (YAV in the return), the boiler is only heated so that the required system temperature can be reached in the buffer storage tank.

Although it is controlled downstream of the system flow sensor, the system return temperature is indirectly the value that counts. If this value approaches the buffer storage tank temperature, more and more heat will be required from the gas boiler.

System flow control ensures that the gas boiler always receives the low system flow temperatures and not the temperatures preheated by the buffer storage tank. At the same time, the buffer energy is fully utilised. High utilisation of condensing technology with optimum exploitation of the CHP energy is ensured.

Calorifier with higher charging temperatures
In systems with higher DHW charging temperatures, direct charging from the boiler (the YAV mixing valve is then closed via a relay during DHW charging) is recommended.

Output of heat generators with additional heating
With this type of hydraulic integration, both heat generators can deliver their output (parallel operation), which means that the gas boiler has to be designed in such a way that it can produce the entire output.



Description

Hoval PowerBloc EG

- Ready-for-operation combined heat and power plants (CHP plants) in modular design for the supply of heat and electricity.
- For heat- or current-regulated operation
- For operation with natural gas; on request, for operation with biogas and sewer gas
- Hoval must be consulted with regard to the exact gas quality required for operation.
- High efficiency rates through optimum conversion of engine power and combustion heat into thermal heat and electricity.
- Installed
  - Water-cooled spark-ignition gas engine
  - Supply air axial fan
  - Tube bundle heat exchangers for the utilisation of exhaust gas heat
  - Plate heat exchanger for utilisation of the combustion engine cooling water
  - Exhaust gas line with catalyst and silencer
  - Controlled gas system, gas mixer
  - Automatic lubricating oil supply
  - Air-cooled synchronous generator for electricity generation
  - Electrical control panel with CHP plant regulation and control system
  - Starter batteries and synchronous generator for operation as an emergency power supply without increasing the wattless current requirement.
  - Starter system
  - Unit control system
  - Ignition system (processor-controlled)
- The engine and generator are mounted with vibration-damped bearings, and the casing is equipped with sound insulation.
- Automatic, low-maintenance lubricating oil supply minimises operating costs and downtimes.
- All pipes on the heating and exhaust gas side are of flexible design for vibration-damping
- Sound reduction capsule made from self-supporting sheet steel. Colour:
  - RAL 7016 base and frame construction
  - RAL 3011 doors, ceiling and rear side
  - RAL 3000 electrical control panel
- Heating armature group for heat extraction with return temperature control
- The wide range of standard equipment and ready-to-connect compact design saves time and money during planning and installation
- Factory test run
- Works commissioning
- Documentation

Design on request
- Design for biogas operation
- Emergency cooler
- Sound insulation cabin for higher requirements
- Low-frequency silencer (2nd exhaust gas silencer)
- Ventilation system
- Gas warning system
- Gas pressure booster
- Containerised version for weatherproof outdoor installation
- Prefabricated concrete container
- Unloading of the CHP plant and transport to the installation site

	Series PowerBloc EG type	Output Electrical kW	Thermal kW
A+	(43)	43	63
	(50)	50	79
	(70)	70	113
	(104) [1,2)]	100	136
	(130)	132	193
	(140)	142	207
	(210) [1,2)]	210	248
	(210/NOx) [1,2)]	210	263
	(260)	263	375
	(305)	308	365
	(305/NOx)	308	408
	(355) [1,2)]	356	426
	(355/NOx) [1,2)]	356	456
	(430) [1,2)]	434	516
	(430/NOx) [1,2)]	434	581
	(530) [1,2)]	531	603
	(530/NOx) [1,2)]	531	630

[1] Supplied in Liechtenstein, Switzerland and Austria with special exhaust gas purification (optional)

[2] Supercharged engine

Approvals

PowerBloc EG (43-130)
MOE 13-0468-34

PowerBloc EG (210-530)
MOE 13-0468-38

PowerBloc EG (430)
Approval applied

- Plant-specific control and remote monitoring systems
- Peak load boiler, e.g. oil or gas
- System solutions and combinations with further Hoval products for plant optimisation
- Consulting and planning support for engineering and configuration
- Comprehensive service and maintenance concepts.
- Customised configurations

Delivery
- Compact, pre-assembled consignment

On site
- Connection installation for heating, gas, exhaust gas line and electricity, as well as supply and exhaust gas.

Electrical control panel
With CHP plant regulation and control systems integrated on the front side.
Included:

Unit control system with generator coupling field
(power element)
- The CHP unit control consists of a complete modular system of recording and control units and a processor assembly for control and regulation of the CHP plant.
- The central processor assembly is a freely programmable PLC.

Description

The following basic functions are included in the PLC control system:
- Manual and automatic mode
- Engine control (warning messages, triggering of emergency stop)
- Generator control (voltage regulator and cos φ controller)
- Output reduction or stop when temperature limits are exceeded
- Modulation option 60-100 % electrical output
- Operating hours, servicing hours, start and kWh counters
- Activation of generator switch (mains coupling switch optional)
- Activation of controlled gas system with gas leakage testing device
- Electronic speed control with feed-forward control
- Activation for gas mixer and gas damper
- Frequency control, synchronisation, output control
- Counter zero current control
- Parallel mains operation
- Operation as emergency power supply with resynchronisation possible as an option
- Reverse power protection
- Return flow temperature increase for the heating circuit
- Fault memory

Also installed
- Graphic touch panel:
  - EG (43-140) 7″
  - EG (210-530) 12.1″
- 4-pole generator switch with drive/generator contactor
- Current transformer set
- 3-phase voltage monitoring, mains and generator
- Engine monitoring/safety system
- Synchronisation/output control
- Speed of rotation/frequency monitoring
- Charging device for starter motor and control batteries, battery monitoring
- Fuse sets for engine, mixture and heating circuit pump
- Fuse sets for emergency and mixture cooler
- The CHP unit control system realises full potential separation between the grid-generator module and the PLC processing level.
- There are special signal processing assemblies for grid and generator signals upstream of the control processor for this purpose.
- Here, faults are filtered out, phase condition and amplitude of current and voltage signals from the grid and generator evaluated and prepared for further processing in the processor assembly.
- The preconditions for connection of the CHP plant to the energy supply company grid in accordance with Section 9 VDEW are met. (Parallel operation with the low-voltage grid)
- Storage level control can be activated incl. 4 sensors

Interfaces
- Analogue input for setpoint definition
- Digital inputs for Start/Stop, RSE-energy supply company
- Analogue output for actual output
- Digital outputs for Ready for operation, Parallel mains, Warning, Fault
- Ethernet connection for remote monitoring and remote diagnosis (an internet connection with VPN tunnel must be provided on site)
- Optional - analogue modem (if there is no existing internet connection)
- Optional - Profibus DP for connection of an external control system

PC remote maintenance access WEB
- Integration on Ethernet basis
- Operation from an external PC is possible via a network connection (internet or company network).
- Preconditions are a network connection and a web browser (e.g. Internet Explorer).
- The browser accesses a website stored in the control system.
- No other programs are required for the PC.

Delivery
- Installation of a web server and programming of the unit control system
- Ethernet interface (hub) for the control system
- Setting and function test of the web connection and access rights
- Instruction of operating personnel during commissioning of the CHP plant

Required on site
- VPN router for remote diagnosis access via the Internet
- PC with Ethernet interface and web browser
- Ethernet connection from PC to unit control system (network cable)

Engine
- Water-cooled four-stroke spark-ignition/gas engine suitable for CHP plants and continuous operation (COP operation).
- Cooling water system with plate heat exchanger for energy recovery with
  - pressure expansion tank and safety valve (closed circuit)
  - cooling water pump and sensor systems
- Performance data applies under standard reference conditions
  - Air pressure (absolute): 1,000 hPa
  - Air temperature: 298 K
  - Relative humidity: 30 %
  - Power adjustment under other ambient conditions is performed in accordance with DIN ISO 3046-1.

Also included
- Contact-free, magnetically inductive engine speed sensors
- Cooling water temperature sensor
- Cooling water pressure sensor
- Lubricating oil temperature sensor
- Lubricating oil pressure sensor
- Mixture temperature sensor, if required
- Mixture pressure sensor, if required

Lubricating oil supply
- Automatic lubricating oil supply
- With additional fresh oil tank, inspection glass and engine oil sump.
- Solenoid valve in the oil supply line, activation via level sensor.

Exhaust gas system
- With tube bundle heat exchanger for utilisation of exhaust gas heat; with pipework on the inside, insulated and fitted with all necessary control and safety devices.
- Stainless steel exhaust gas pipe with unit silencer (1st exhaust gas silencer) and 3-way catalyst or oxidation catalyst and compensators.

Controlled gas system for natural gas
Included:
- ball valve with thermal fitting protection
- gas filter
- pressure gauge with push button cock
- min. pressure monitor
- solenoid valves (2x)
- leakage monitor (if required)
- zero pressure regulator gas mixing device

Generator
- Air-cooled three-phase synchronous generator, in accordance with VDE 0530, DIN 6280, Part 3.
- Suitable for parallel mains operation and for optional operation of an emergency power supply.
- With automatic cos φ regulation, electronic voltage regulation and static transformer.
- Stability-tested at p.f. 0.95 (capacitive)

Heating armature group
Armature group with return temperature control for heat extraction and for on-site attachment to the CHP plant, plus safety equipment in accordance with EN 12828.

Notice
If not stated otherwise, all technical data refers to full-load engine operation.

Works commissioning
The scope of delivery includes “warm” works commissioning with a setting report.

■ **Part No.**

Combined heat and power plant
Hoval PowerBloc EG

PowerBloc EG (43-530)

Type	
(43)	**on request**
(50)	**on request**
(70)	**on request**
(104)[1,2]	**on request**
(130)	**on request**
(140)	**on request**
(210) [1,2)]	**on request**
(210/NOx) [1,2)]	**on request**
(260)	**on request**
(305)	**on request**
(305/NOx)	**on request**
(355) [1,2)]	**on request**
(355/NOx) [1,2)]	**on request**
(430) [1,2)]	**on request**
(430/NOx) [1,2)]	**on request**
(530) [1,2)]	**on request**
(530/NOx) [1,2)]	**on request**

[1] Supplied in Liechtenstein, Switzerland and Austria with special exhaust gas purification (optional).
[2] Supercharged engine

Flexible connections
Delivery, installation on-site for insulation against vibration and structure-borne sound
Consisting of:
- 2x heat decoupling hoses
- 1x fuel hose
- 1x exhaust gas expansion joint
- 2x ventilation connections
- 2x mixture cooling circuit hoses (depending on the model)

for PowerBloc EG	
(43)	**on request**
(50)	**on request**
(70)	**on request**
(104)	**on request**
(130)	**on request**
(140)	**on request**
(210)	**on request**
(210/NOx)	**on request**
(260)	**on request**
(305)	**on request**
(305/NOx)	**on request**
(355)	**on request**
(355/NOx)	**on request**
(430)	**on request**
(430/NOx)	**on request**
(530)	**on request**
(530/NOx)	**on request**

Extended exhaust gas purification
Nitrogen oxide (NOx) < 50 mg/m³
Carbon monoxide (CO): < 100 mg/m³
with 5 % residual oxygen

for PowerBloc EG	
(43,50)	**on request**
(70)	**on request**
(130,140)	**on request**
(260)	**on request**

■ **Part No.**

Interface

Connection to a higher-level control system

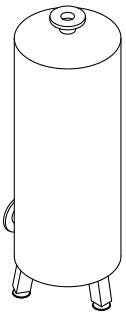
Modbus-TCP	**on request**
SAIA S-Bus	**on request**
Profibus DP	**on request**
Ethernet interface	**on request**
LAN-LAN router	**on request**
LTE-LAN router	**on request**

Ventilation controller recirc.&room air **on request**

Control supply and extract air, optional bypass damper for heating the intake air, optional re-circulation damper for heating the room air

Electricity meter with converter **on request**

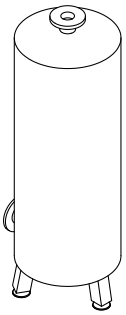
Electronic net electricity meter mounted in module control cabinet. With MID approval, M-bus interface and calibrated current con-verters.



Low-frequency silencer Type S

As 2nd exhaust gas silencer for further re-duction of exhaust gas sound pressure level. Residual sound pressure level: 52 or 55 db(A) at a distance of 10 m from the exhaust gas out-let. The 1st exhaust gas silencer is contained in the CHP unit module.

for PowerBloc EG	
(43,50)	**on request**
(70)	**on request**
(104,140)	**on request**
(210-260)	**on request**
(305-430)	**on request**
(530)	**on request**



Low-frequency silencer Type G

As 2nd exhaust gas silencer for further re-duction of exhaust gas sound pressure level. Residual sound pressure level: 40 or 45 db(A) at a distance of 10 m from the exhaust gas out-let. The 1st exhaust gas silencer is contained in the CHP unit module.

for PowerBloc EG	
(43,50)	**on request**
(70)	**on request**
(104,140)	**on request**
(210-260)	**on request**
(305-430)	**on request**
(530)	**on request**

Network and system protection

Expansion of power supply unit with integr. NA protection acc. to VDE-AR-N 4105

for PowerBloc EG	
(43,50)	**on request**
(70)	**on request**
(104)	**on request**
(130)	**on request**
(140)	**on request**
(210-260)	**on request**
(305)	**on request**
(355)	**on request**
(430)	**on request**
(530)	**on request**

The increased space requirement of the ad-ditional protective devices means a separate transfer switch cabinet may be required for the transformer feeder cable, depending on the feeder cable.

■ **Part No.**

Emergency cooling

For the emergency cooling circuit, the corresponding components (table cooler, pump, heat exchanger, three-way valve and actuator, control included in the module controller) are provided. The on-site installation incl. pipes, insulation and cabling is done on-site acc. to the provided hydraulic and electrical diagrams.

for PowerBloc EG

(43)	**on request**
(50)	**on request**
(70)	**on request**
(104)	**on request**
(130,140)	**on request**
(210)	**on request**
(210/NOx)	**on request**
(260)	**on request**
(305)	**on request**
(305/NOx)	**on request**
(355)	**on request**
(355/NOx)	**on request**
(430)	**on request**
(430/NOx)	**on request**
(530)	**on request**
(530/NOx)	**on request**

Emergency power function manual **on request**

Backup power manual operation (basic position)
This comprises the work involved in uprating the module controller for the backup power operation (grid monitoring, etc.). At the client's the system must be equipped with a corresponding mains coupling switch and measuring instruments for the module control.

Stainless steel condensation ball **on request**

The exhaust gas condensation line must be configured acc. to the conditions in the building so no exhaust gas can emerge through this pipe. The stainless steel condensation ball set is installed in the condensation pipe for this purpose.

Gas detection system **on request**

Gas measuring computer with a gas sensor
and connection to the module controller.
Prealarm set to 20 % LEL
Main alarm set to 40 % LEL
integr. relay contacts for alarm message
relay contact can be acknowledged
for activating a horn (optional),
installation by client

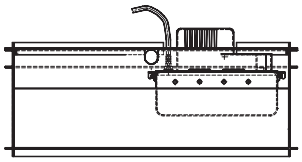
Smoke warning system **on request**

Smoke detector for the CHP unit room battery
operation without mains power
integr. acoustic warning sound
integr. relay contact for alarm message
to the module controller,
installation by the client

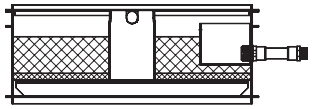
■ **Part No.**

Oil/water warning device **on request**
Oil/water warning system with a sensor for the oil collecting tray. Connection to the module controller with safety stop. Installation by the client

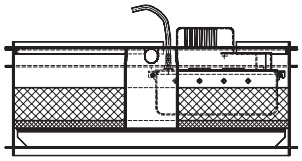
Warning horn and light **on request**
Horn and warning light in outdoor area
Activation by the module controller
or the gas warning system
Installation by the client



Condensate box KB 22 **on request**
for UltraGas® (125-1150), (250D-2300D),
UltraOil® (65-300), (320D-600D)
For condensate drainage into higher situated drain pipe with delivery pump.
Max. delivery height 3.5 m, from 1200 kW two delivery pumps necessary.
Delivery rate 120 l/h
incl. liquid level switch, silicone hose 9/13 mm, 4 m long, electrical cable
1.5 m with plug
Use one box per boiler.



Neutralisation box KB 23 **on request**
for UltraGas® (125-1150), (250D-2300D),
UltraOil® (65-300), (320D-600D)
Condensate drainage into lower situated drain pipe without condensate delivery pump
with neutralisation
12 kg neutralisation granulate
Placed under the boiler
Use one box per boiler.



Neutralisation box KB 24 **on request**
for UltraGas® (125-1150), (250D-2300D),
UltraOil® (65-300), (320D-600D)
for transporting condensation water into a higher lying drainage duct,
max. delivery height 3.5 m, from 1200 kW two delivery pumps necessary.
Delivery rate 120 l/h
incl. liquid level switch, silicone hose 9/13 mm, 4 m long, electrical cable
1.5 m with plug
12 kg granulate
Use one box per boiler.

Neutralisation granulate **on request**
for neutralisation box
Refill set volume 3 kg
Life time of one filling:
approx. 2-4 years;
depending on amount of condensate

■ **Part No.**

Control panel with tank fill level control for CHP plant This module control extension is used to de-/select CHP plants based on the tank loading status. Consisting of: Temperature recording module for 8 sensors Software adjustment and visualisation Relay assemblies and 8 sensors Separate control panel On site installation of provided sensors as well as wiring for control panel and module control.	**on request**

Service

Check visit before commissioning	
Obligatory commissioning	
PowerBloc EG	
(43,50)	**on request**
(70)	**on request**
(104,140)	**on request**
(210-260)	**on request**
(305)	**on request**
(355)	**on request**
(430)	**on request**
(530)	**on request**
Obligatory commissioning Emergency power function	**on request**
Delivery	
Modular version	**on request**
Containerised version [1]	**on request**
Unloading and transport	
Modular version	**on request**
Containerised version [1]	**on request**

[1] For weatherproof outdoor installation

Technical data

Hoval PowerBloc EG (43-104)

Type			(43)	(50)	(70)	(104)
Electrical power [4]		kW	26-43	31-50	41-70	62-100
Thermal output [4]		kW	43-63	56-79	73-113	104-136
Firing heat output		kW	89-129	103-146	136-204	184-273
Electrical efficiency	(full load 100 %)	%	33.4	34.3	34.4	36.6
	(partial load 80 %)	%	31.2	33.0	32.9	35.3
	(partial load 60 %)	%	29.4	30.2	30.2	33.8
Thermal efficiency	(full load 100 %)	%	48.8	54.1	55.4	49.7
	(partial load 80 %)	%	49.0	53.7	53.7	52.3
	(partial load 60 %)	%	48.9	54.4	53.4	56.6
Total efficiency	(full load 100 %)	%	82.2	88.4	89.7	86.3
	(partial load 80 %)	%	80.2	86.7	86.6	87.6
	(partial load 60 %)	%	78.3	84.6	83.6	90.4
Power to heat ratio at full load			0.68	0.63	0.62	0.74
Flow temperature		°C	90	90	90	90
Minimum/maximum return temperature		°C	50/70	50/70	50/70	50/70
Volume flow heating		m^3/h	2.8	3.5	5.0	6.0
Minimum/maximum operating pressure (psv 3 bar) [2]		bar	1/2.5	1/2.5	1/2.5	1/2.5
Hydraulic resistance		mbar	50-60	50-60	50-60	50-60
Minimum/maximum gas pressure		mbar	18-100	18-100	18-100	18-100
Gas consumption		m^3/h	12.9	14.6	20.4	27.3
Exhaust gas temperature		°C	120	120	120	120
Maximum exhaust gas back pressure		kPa	1.5	1.5	1.5	1.5
Exhaust gas flow - moist		kg/h	159	192	272	566
Exhaust gas flow - dry		m^3/h	129	156	221	510
Standard emission rate	nitrogen oxide (NOx)	mg/m^3	<250	<250	<250	<500
	carbon monoxide (CO)	mg/m^3	<300	<300	<300	<300
Supply air temperature		°C	10-30	10-30	10-30	10-30
Supply air flow		m^3/h	2639	3012	4451	4030
Combustion air		m^3/h	150	181	257	511
Residual pressure for supply/exhaust air system		Pa		approx. 100		
Maximum extract air temperature		°C	50	50	50	50
Extract air quantity		m^3/h	2517	2865	4241	3613
Maximum radiant heat		kW	12	17	23	13
Dimensions				see dimensional drawing		
Sound emission at 1 m distance [1.3]		dB(A)	62	62	68	70
Exhaust gas sound emission at 10 m distance [3]		dB(A)	65	65	70	70
As above with low-frequency silencer (external) (type G)		dB(A)	40	40	45	45
Engine manufacturer			MAN	MAN	MAN	MAN
Model			E0834 E312	E0834 E302	E0836 E302	E0836 LE302
ISO-standard output		kW	47	54	75	107
Nominal speed of rotation		rpm	1500	1500	1500	1500
Fuel			natural gas	natural gas	natural gas	natural gas
Cylinder			4	4	6	6
Displacement		dm^3	4.58	4.58	6.87	6.87
Bore		mm	108	108	108	108
Stroke		mm	125	125	125	125
Average effective pressure		bar	8.21	9.43	8.73	12.80
Average piston speed		m/s	6.3	6.3	6.3	6.25
Compression ratio			13:1	13:1	13:1	11:1
Lubricating oil consumption		kg/h	0.040	0.040	0.060	0.075
Lubricating oil volume min./max.		dm^3	17/25	17/25	24/34	24/34
Generator manufacturer				Stamford		
Model			UCG224E2	UCG224F2	UCG274C2	UCG274E2
Type			synchronous	synchronous	synchronous	synchronous
Type power rating		kVA	51	62	85	119
Speed of rotation		rpm	1500	1500	1500	1500
Efficiency		%	93	94.7	92.8	93.7
Voltage		V	400	400	400	400
Current		A	69	82	111	165
Frequency		Hz	50	50	50	50
Type of protection			IP23	IP23	IP23	IP23
Insulation class			H	H	H	H
Temperature rise class			F	F	F	F
Total weight	empty	kg	2000	2100	2600	3350
	when filled	kg	2100	2200	2700	3500

[1] All noise-related data apply to operation with closed casing. The technical data above are based on natural gas with a calorific value of 36.0 MJ/m³ (10.0 kWh/m³) and a methane number higher than 80. Performance data apply under standard reference conditions: air pressure 1000 hPa, air temperature 298 K, relative air humidity 30 %. Power at generator terminals at cos φ = 1.0

[2] Maximum operating pressure 5.4 bar possible at psv 6 bar

[3] Sound pressure level +/- 3 dB(A)

[4] The motors used are designed for continuous operation at 100 % nominal output.
Information about partial load operation can be found in the project planning guidelines.

Technical data

Hoval PowerBloc EG (130-260)

Type			(130)	(140)	(210)	(210/NOx)	(260)
Electrical power [4]		kW	79-132	85-142	126-210	126-210	157-263
Thermal output [4]		kW	142-193	147-207	166-248	183-263	264-375
Firing heat output		kW	240-356	261-392	336-529	349-553	457-693
Electrical efficiency	(full load 100 %)	%	37.1	36.3	39.7	38.0	37.9
	(partial load 80 %)	%	35.5	34.8	38.9	37.4	36.5
	(partial load 60 %)	%	32.9	32.6	37.5	36.1	34.4
Thermal efficiency	(full load 100 %)	%	54.2	52.8	46.9	47.6	54.0
	(partial load 80 %)	%	56.4	54.5	47.2	49.6	55.6
	(partial load 60 %)	%	59.2	56.3	49.3	52.6	57.7
Total efficiency	(full load 100 %)	%	91.3	89.1	86.6	85.5	92.0
	(partial load 80 %)	%	91.9	89.4	86.1	87.0	92.1
	(partial load 60 %)	%	92.1	88.9	86.8	88.7	92.1
Power to heat ratio at full load			0.68	0.69	0.85	0.80	0.70
Flow temperature		°C	90	90	90	90	90
Minimum/maximum return temperature		°C	50/70	50/70	50/70	50/70	50/70
Volume flow heating		m³/h	8.5	9.2	11.0	11.6	16.6
Minimum/maximum operating pressure (psv 3 bar) [2]		bar	1/2.5	1/2.5	1/2.5	1/2.5	1/2.5
Hydraulic resistance		mbar	50-60	50-60	50-60	50-60	50-60
Minimum/maximum gas pressure		mbar	18-100	18-100	18-100	18-100	18-100
Gas consumption		m³/h	35.6	39.2	52.9	55.3	69.3
Exhaust gas temperature		°C	120	120	120	120	120
Maximum exhaust gas back pressure		kPa	1.5	1.5	1.5	1.5	1.5
Exhaust gas flow - moist		kg/h	461	503	1196	1147	901
Exhaust gas flow - dry		m³/h	367	409	983	948	730
Standard emission rate	nitrogen oxide (NOx)	mg/m³	<250	<250	<500	<250	<250
	carbon monoxide (CO)	mg/m³	<300	<300	<300	<100	<300
Supply air temperature		°C	10-30	10-30	10-30	10-30	10-30
Supply air flow		m³/h	4010	5076	5873	5831	6918
Combustion air		m³/h	736	475	1157	1106	851
Residual pressure for supply/exhaust air system		Pa			approx. 100		
Maximum extract air temperature		°C	50	50	50	50	50
Extract air quantity		m³/h	3409	4689	4929	4929	6224
Maximum radiant heat		kW	17	28	22	22	24
Dimensions					see dimensional drawing		
Sound emission at 1 m distance [1.3]		dB(A)	70	70	70	70	70
Exhaust gas sound emission at 10 m distance [3]		dB(A)	70	70	70	70	70
As above with low-frequency silencer (external) (type G)		dB(A)	45	45	45	45	45
Engine manufacturer			MAN	MAN	MAN	MAN	MAN
Model			E2676 E302	E2876 E312	E2676 LE202	E2676 LE202	E3262 E302
ISO-standard output		kW	140	150	220	220	275
Nominal speed of rotation		rpm	1500	1500	1500	1500	1500
Fuel			natural gas	natural gas	natural gas	natural gas	Erdgas
Cylinder			6	6	6	6	12
Displacement		dm³	12.4	12.82	12.4	12.4	25.78
Bore		mm	126	128	126	126	132
Stroke		mm	166	166	166	166	157
Average effective pressure		bar	8.9	9.36	14.2	14.2	8.5
Average piston speed		m/s	8.3	8.3	8.3	8.3	7.85
Compression ratio			12:1	12:1	12.6:1	12.6:1	12:1
Lubricating oil consumption		kg/h	0.080	0.125	0.15	0.15	0.110
Lubricating oil volume min./max.		dm³	50/70	35/70	50/70	50/70	70/90
Generator manufacturer			Stamford		Marelli Generators		
Model			UCG274H2	UCG274H2	MJB315MA4	MJB315MA4	MJB315MB4
Type			synchronous	synchronous	synchronous	synchronous	synchron
Type power rating		kVA	170	170	350	350	390
Speed of rotation		rpm	1500	1500	1500	1500	1500
Efficiency		%	95.1	94.9	95.5	95.5	95.9
Voltage		V	400	400	400	400	400
Current		A	213	228	319	319	400
Frequency		Hz	50	50	50	50	50
Type of protection			IP23	IP23	IP23	IP23	IP23
Insulation class			H	H	H	H	H
Temperature rise class			F	F	F	F	F
Total weight	empty	kg	4500	3700	4700	4700	7050
	when filled	kg	4700	3900	4900	4900	7250

[1] All noise-related data apply to operation with closed casing for sound insulation. The technical data above are based on natural gas with a calorific value of 36.0 MJ/m³ (10.0 kWh/m³) and a methane number higher than 80. Performance data apply under standard reference conditions: air pressure 1000 hPa, air temperature 298 K, relative air humidity 30 %. Power at generator terminals at cos φ = 1.0

[2] Maximum operating pressure 5.4 bar possible at psv 6 bar

[3] Sound pressure level +/- 3 dB(A)

[4] The motors used are designed for continuous operation at 100 % nominal output.
Information about partial load operation can be found in the project planning guidelines.

Technical data

Hoval PowerBloc EG (355-430/NOx)

Type			(305)	(305/NOx)	(355)	(355/NOx)
Electrical power [4]		kW	185-308	185-308	213-356	213-356
Thermal output [4]		kW	242-365	273-408	280-426	306-456
Firing heat output		kW	463-767	496-816	555-889	591-937
Electrical efficiency	(full load 100 %)	%	40.2	37.9	40.0	38.0
	(partial load 80 %)	%	39.1	36.9	39.4	37.1
	(partial load 60 %)	%	39.6	37.3	38.4	36.0
Thermal efficiency	(full load 100 %)	%	46.4	50.0	47.9	48.7
	(partial load 80 %)	%	49.8	52.1	49.2	50.2
	(partial load 60 %)	%	52.3	55.0	50.4	51.8
Total efficiency	(full load 100 %)	%	86.6	87.9	88.0	86.7
	(partial load 80 %)	%	88.9	89.0	88.6	87.3
	(partial load 60 %)	%	91.9	92.3	88.7	87.9
Power to heat ratio at full load			0.85	0.76	0.84	0.78
Flow temperature		°C	90	90	90	90
Minimum/maximum return temperature		°C	50/70	50/70	50/70	50/70
Volume flow heating		m³/h	16.1	18.0	18.8	20.2
Minimum/maximum operating pressure (psv 3 bar) [2]		bar	1/2.5	1/2.5	1/2.5	1/2.5
Hydraulic resistance		mbar	50-60	50-60	50-60	50-60
Minimum/maximum natural gas pressure		mbar	18-100	18-100	18-100	18-100
Gas consumption		m³/h	76.7	81.6	88.9	93.7
Exhaust gas temperature		°C	120	120	120	120
Maximum exhaust gas back pressure		kPa	1.5	1.5	1.5	1.5
Exhaust gas flow - moist		kg/h	1657	1762	1846	1956
Exhaust gas flow - dry		m³/h	1321	1406	1476	1632
Standard emission rate	nitrogen oxide (NOx)	mg/m³	<500	<250	<500	<250
	carbon monoxide (CO)	mg/m³	<300	<300	<300	<100
Supply air temperature		°C	10-30	10-30	10-30	10-30
Supply air flow		m³/h	7160	7840	9041	9587
Combustion air		m³/h	1352	1438	1777	1883
Residual pressure for supply/exhaust air system		Pa		approx. 100		
Maximum extract air temperature		°C	50	50	50	50
Extract air quantity		m³/h	5808	6402	7590	8050
Maximum radiant heat		kW	29	32	37	39
Dimensions				see dimensional drawing		
Sound emission at 1 m distance [1.3]		dB(A)	73	73	73	73
Exhaust gas sound emission at 10 m distance [3]		dB(A)	70	70	70	70
As above with low-frequency silencer (external) (type G)		dB(A)	45	45	45	45
Engine manufacturer			MAN	MAN	MAN	MAN
Model			E3268 LE242	E3268 LE242	E3268 LE212	E3268 LE212
ISO-standard output		kW	320	320	370	370
Nominal speed of rotation		rpm	1500	1500	1500	1500
Fuel			natural gas	natural gas	natural gas	natural gas
Cylinder			8	8	8	8
Displacement		dm³	17.19	17.19	17.19	17.19
Bore		mm	132	132	132	132
Stroke		mm	157	157	157	157
Average effective pressure		bar	17.2	17.2	17.2	17.2
Average piston speed		m/s	7.85	7.85	7.85	7.85
Compression ratio			12:1	12:1	12:1	12:1
Lubricating oil consumption		kg/h	0.140	0.140	0.140	0.140
Lubricating oil volume min./max.		dm³	75/95	75/95	42/95	42/95
Generator manufacturer				Marelli Generators		
Model			MJB355SB4	MJB355SB4	MJB355MA4	MJB355MA4
Type			synchronous	synchronous	synchronous	synchronous
Type power rating		kVA	400	400	590	590
Speed of rotation		rpm	1500	1500	1500	1500
Efficiency		%	96.2	96.2	96.5	96.5
Voltage		V	400	400	400	400
Current		A	468	468	541	514
Frequency		Hz	50	50	50	50
Type of protection			IP23	IP23	IP23	IP23
Insulation class			H	H	H	H
Temperature rise class			F	F	F	F
Total weight	empty	kg	7250	7250	7500	7700
	when filled	kg	7550	7550	7700	7900

[1] All noise-related data apply to operation with closed casing for sound insulation. The technical data above are based on natural gas with a calorific value of 36.0 MJ/m³ (10.0 kWh/m³) and a methane number higher than 80. Performance data apply under standard reference conditions: air pressure 1000 hPa, air temperature 298 K, relative air humidity 30 %. Power at generator terminals at cos φ = 1.0

[2] Maximum operating pressure 5.4 bar possible at psv 6 bar

[3] Sound pressure level +/- 3 dB(A)

[4] The motors used are designed for continuous operation at 100 % nominal output.
Information about partial load operation can be found in the project planning guidelines.

Technical data

Hoval PowerBloc EG (530-530/NOx)

Type			(430)	(430/NOx)	(530)	(530/NOx)
Electrical power [4]		kW	260-434	260-434	318-531	318-531
Thermal output [4]		kW	349-516	385-581	394-603	407-630
Firing heat output		kW	693-1090	737-1169	821-1310	842-1348
Electrical efficiency	(full load 100 %)	%	39.8	37.1	40.5	39.4
	(partial load 80 %)	%	39.0	36.5	40.0	38.9
	(partial load 60 %)	%	37.5	35.3	38.7	37.8
Thermal efficiency	(full load 100 %)	%	47.3	49.7	46.0	46.7
	(partial load 80 %)	%	48.4	50.5	46.8	47.3
	(partial load 60 %)	%	50.3	52.2	48.0	48.3
Total efficiency	(full load 100 %)	%	87.2	86.8	86.6	86.1
	(partial load 80 %)	%	87.4	87.0	86.7	86.2
	(partial load 60 %)	%	87.9	87.4	86.7	86.1
Power to heat ratio at full load			0.84	0.75	0.88	0.84
Flow temperature		°C	90	90	90	90
Minimum/maximum return temperature		°C	50/70	50/70	50/70	50/70
Volume flow heating		m^3/h	22.8	25.7	26.7	27.9
Minimum/maximum operating pressure (psv 3 bar) [2]		bar	1/2.5	1/2.5	1/2.5	1/2.5
Hydraulic resistance		mbar	50-60	50-60	50-60	50-60
Minimum/maximum natural gas pressure		mbar	18-100	18-100	18-100	18-100
Gas consumption		m^3/h	109.0	116.9	131.0	134.8
Exhaust gas temperature		°C	120	120	120	120
Maximum exhaust gas back pressure		kPa	1.5	1.5	1.5	1.5
Exhaust gas flow - moist		kg/h	2364	2492	2750	2848
Exhaust gas flow - dry		m^3/h	1887	1991	2200	2277
Standard emission rate	nitrogen oxide (NOx)	mg/m^3	<500	<250	<500	<250
	carbon monoxide (CO)	mg/m^3	<300	<100	<300	<100
Supply air temperature		°C	10-30	10-30	10-30	10-30
Supply air flow		m^3/h	10141	12082	13432	15119
Combustion air		m^3/h	2280	2403	2648	2743
Residual pressure for supply/exhaust air system		Pa		approx. 100		
Maximum extract air temperature		°C	50	50	50	50
Extract air quantity		m^3/h	8280	10120	11270	12880
Maximum radiant heat		kW	54	62		
Dimensions				see dimensional drawing		
Sound emission at 1 m distance [1.3]		dB(A)	73	73	73	73
Exhaust gas sound emission at 10 m distance [3]		dB(A)	70	70	70	70
As above with low-frequency silencer (external) (type G)		dB(A)	45	45	45	45
Engine manufacturer			MAN	MAN	MAN	MAN
Model			E3262 LE232	E3262 LE232	E3262 LE202	E3262LE202
ISO-standard output		kW	450	450	550	550
Nominal speed of rotation		rpm	1500	1500	1500	1500
Fuel			natural gas	natural gas	natural gas	natural gas
Cylinder			12	12	12	12
Displacement		dm^3	25.78	25.78	25.8	25.8
Bore		mm	132	132	132	132
Stroke		mm	157	157	157	157
Average effective pressure		bar	14.0	14.0	17.1	17.1
Average piston speed		m/s	7.85	7.85	7.85	7.85
Compression ratio			12:1	12:1	12:1	12:1
Lubricating oil consumption		kg/h	0.180	0.180	0.180	0.180
Lubricating oil volume min./max.		dm^3	42/90	42/90	42/90	42/90
Generator manufacturer				Marelli Generators		
Model			MJB355MA4	MJB355MA4	MJB355MB4	MJB355MB4
Type			synchronous	synchronous	synchronous	synchronous
Type power rating		kVA	590	590	670	670
Speed of rotation		rpm	1500	1500	1500	1500
Efficiency		%	96.5	96.5	96.6	96.6
Voltage		V	400	400	400	400
Current		A	659	659	807	789
Frequency		Hz	50	50	50	50
Type of protection			IP23	IP23	IP23	IP23
Insulation class			H	H	H	H
Temperature rise class			F	F	F	F
Total weight	empty	kg	7650	7650	7950	7950
	when filled	kg	7850	7850	8150	8150

[1] All noise-related data apply to operation with closed casing for sound insulation. The technical data above are based on natural gas with a calorific value of 36.0 MJ/m³ (10.0 kWh/m³) and a methane number higher than 80. Performance data apply under standard reference conditions: air pressure 1000 hPa, air temperature 298 K, relative air humidity 30 %. Power at generator terminals at cos φ = 1.0

[2] Maximum operating pressure 5.4 bar possible at psv 6 bar

[3] Sound pressure level +/- 3 dB(A)

[4] The motors used are designed for continuous operation at 100 % nominal output.
Information about partial load operation can be found in the project planning guidelines.

Technical data

Allocation of emergency cooler and mixture cooler

for Hoval PowerBloc EG (43-530)

Applicable to all coolers:
- Installation altitude 200 metres above sea level
- Ambient temperature 35 °C
- Reserve surface area approx. 5-10 %

All coolers equipped with:
- Terminal box
- Flange pairs

PowerBloc EG		(43)	(50)	(70)	(104)	(130,140)
Emergency cooler		GFHC FD 050.1/11-42	GFHC FD 050.1/12-44	GFHC FD 063.1/12-42	GFHC FD 063.1/12-42	GFHC FD 063.1/13-44
Recooling power	kW	65	95	137	137	215
Ethylene glycol/water mixture		40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %
Sound pressure level at 10 m	dB(A)	42	44	42	42	44
Sound power level	dB(A)	73	75	74	74	76
Total electrical power consumption max.	kW	0.49	1.03	1.03	1.03	1.55
Mixture cooler		-	-	-	GFHC FD 050.1/11-45	-
Recooling power	kW	-	-	-	17	-
Ethylene glycol/water mixture		-	-	-	40 %-60 %	-
Sound pressure level at 10 m	dB(A)	-	-	-	45	-
Sound power level	dB(A)	-	-	-	77	-
Total electrical power consumption max.	kW	-	-	-	0.72	-
Inlet temperature	°C	-	-	-	46.3	-
Outlet temperature	°C	-	-	-	43.0	-

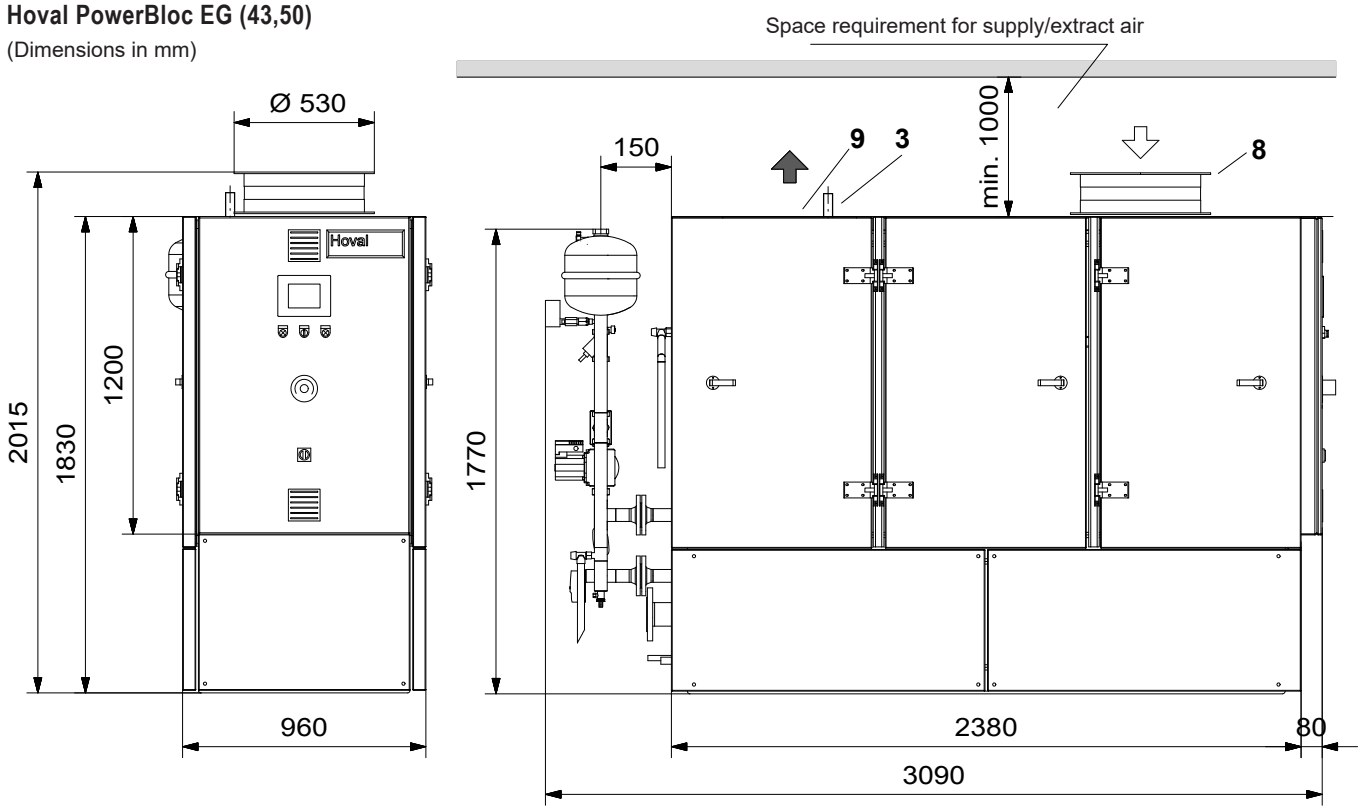
PowerBloc EG		(210)	(210/NOx)	(260)	(305)	(305/NOx)	(355)
Emergency cooler		GFHC FD 063.1/22-45	GFHC FD 063.1/22-45	GFHV FD 080.1NF/13A-44	GFHV FD 080.1NF/13A-44	GFHV FD 080.1PF/14A-45	GFHV FD 080.1NF/13A-44
Recooling power	kW	298	298	431	431	584	431
Ethylene glycol/water mixture		40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %
Sound pressure level at 10 m	dB(A)	45	45	44	44	45	44
Sound power level	dB(A)	76	76	76	76	77	76
Total electrical power consumption max.	kW	2.11	2.11	2.69	2.69	4.35	2.69
Mixture cooler		GFHC FD 050.1/12-43	GFHC FD 050.1/12-45	-	GFHC FD 050.1/12-43	GFHC FD 050.1/12-44	GFHC FD 050.1/12-43
Recooling power	kW	19	26	-	19	28	19
Ethylene glycol/water mixture		40 %-60 %	40 %-60 %	-	40 %-60 %	40 %-60 %	40 %-60 %
Sound pressure level at 10 m	dB(A)	43	45	-	43	44	43
Sound power level	dB(A)	75	77	-	75	76	75
Total electrical power consumption max.	kW	1.06	0.97	-	1.06	0.99	1.06
Inlet temperature	°C	43.9	45.4	-	43.9	45.5	43.9
Outlet temperature	°C	38.5	40.0	-	38.5	40.0	38.5

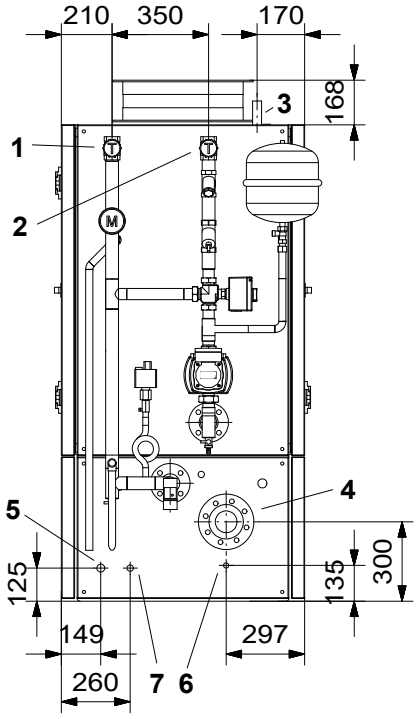
PowerBloc EG		(355/NOx)	(430)	(430/NOx)	(530)	(530/NOx)
Emergency cooler		GFHV FD 080.1PF/14A-45	GFHV FD 080.1PF/14A-45	GFHV FD 080.1PF/14A-45	GFHV FD 080.1QF/14A-45	GFHV FD 080.1QF/14A-45
Recooling power	kW	584	584	584	687	687
Ethylene glycol/water mixture		40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %
Sound pressure level at 10 m	dB(A)	45	45	45	45	45
Sound power level	dB(A)	77	77	77	77	77
Total electrical power consumption max.	kW	4.35	1.21	1.21	3.40	3.40
Mixture cooler		GFHC FD 050.1/12-44	GFHC FD 063.1/12-41	GFHC FD 063.1/12-41	GFHC FD 063.1/12-41	GFHC FD 063.1/12-41
Recooling power	kW	28	38	38	38	38
Ethylene glycol/water mixture		40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %	40 %-60 %
Sound pressure level at 10 m	dB(A)	44	41	41	41	41
Sound power level	dB(A)	76	72	72	72	72
Total electrical power consumption max.	kW	0.99	0.60	0.60	1.11	1.11
Inlet temperature	°C	45.5	45.5	45.5	45.5	45.5
Outlet temperature	°C	40.0	40.0	40.0	40.0	40.0

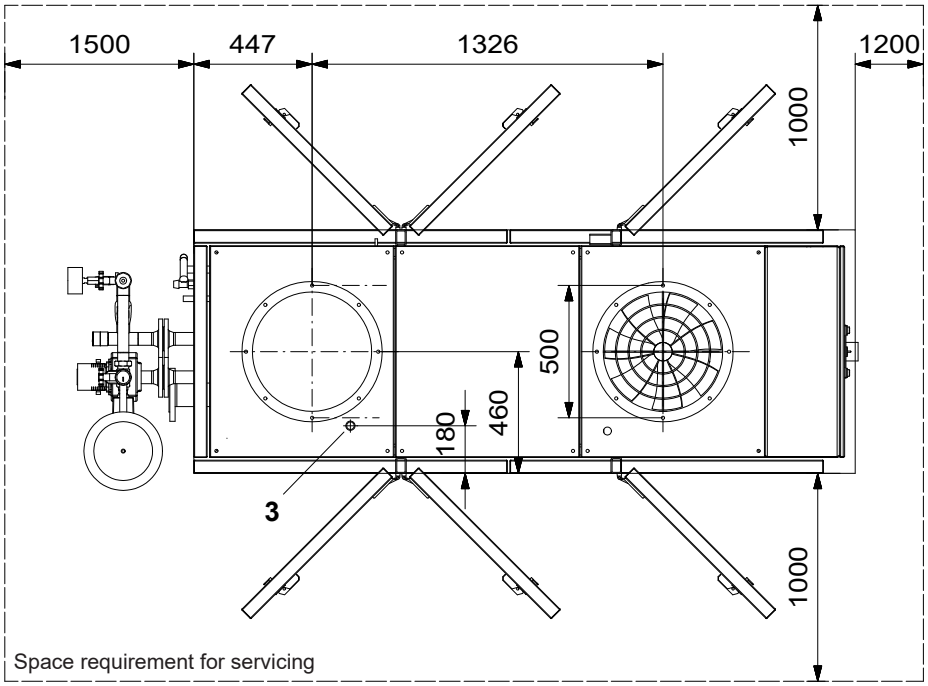
Dimensions

Hoval PowerBloc EG (43,50)

(Dimensions in mm)





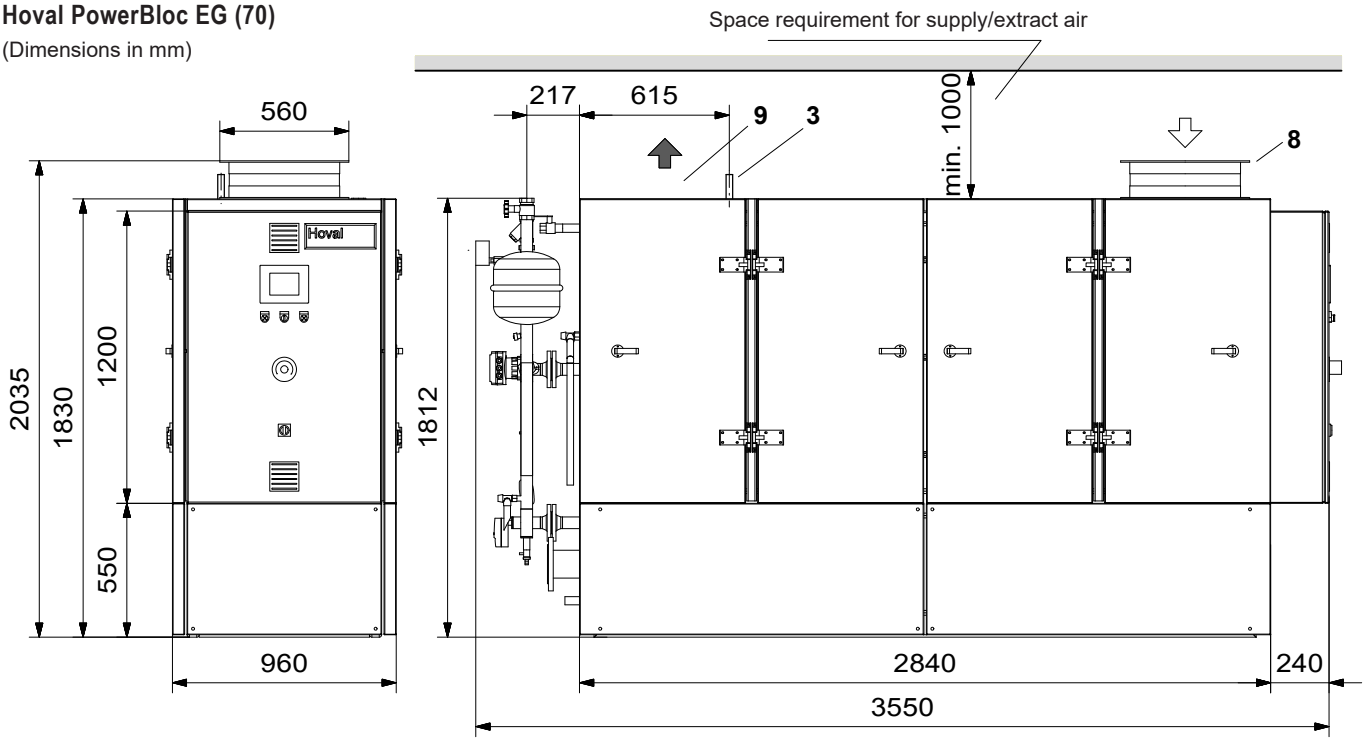


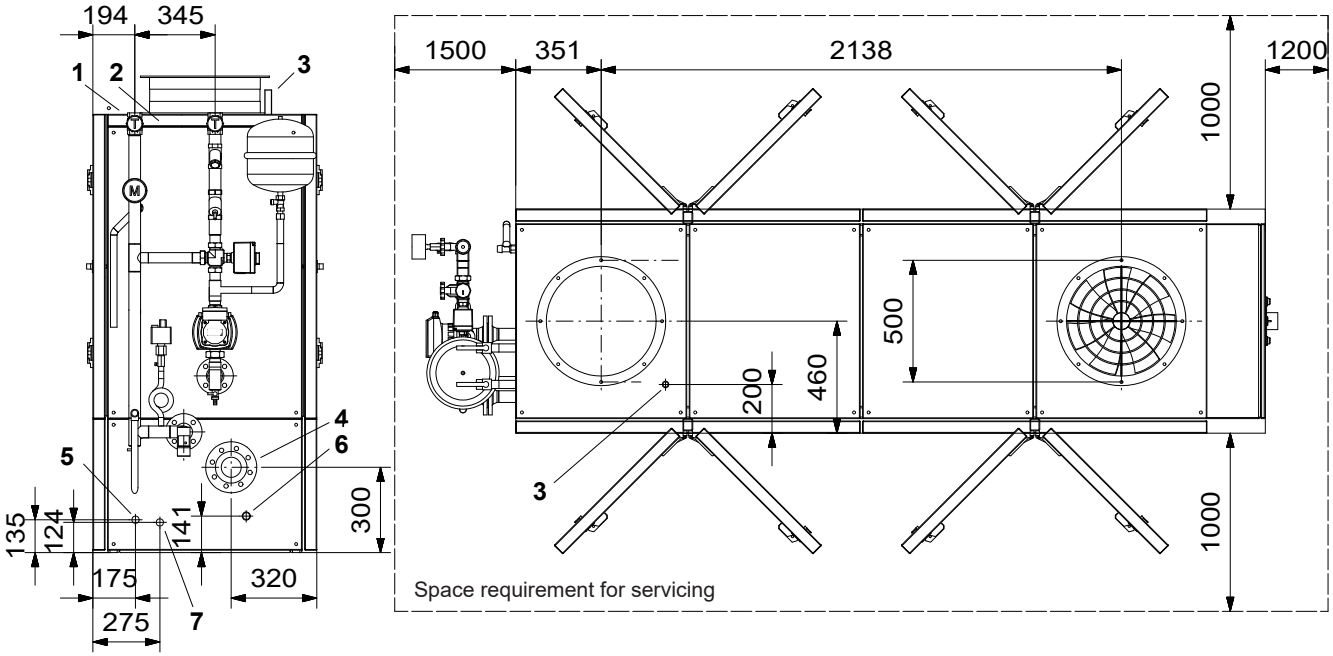
1	Heating flow	Rp 1¼″/PN 6
2	Heating return	Rp 1¼″/PN 6
3	Gas connection	Rp ¾″
4	Exhaust gas connection	DN 80/PN 6
5	Condensate connection left (stainless steel)	22x1 mm
6	Condensate connection right (stainless steel)	22x1 mm
7	Drain	½″
8	Supply air	
9	Extract air	

Dimensions

Hoval PowerBloc EG (70)

(Dimensions in mm)



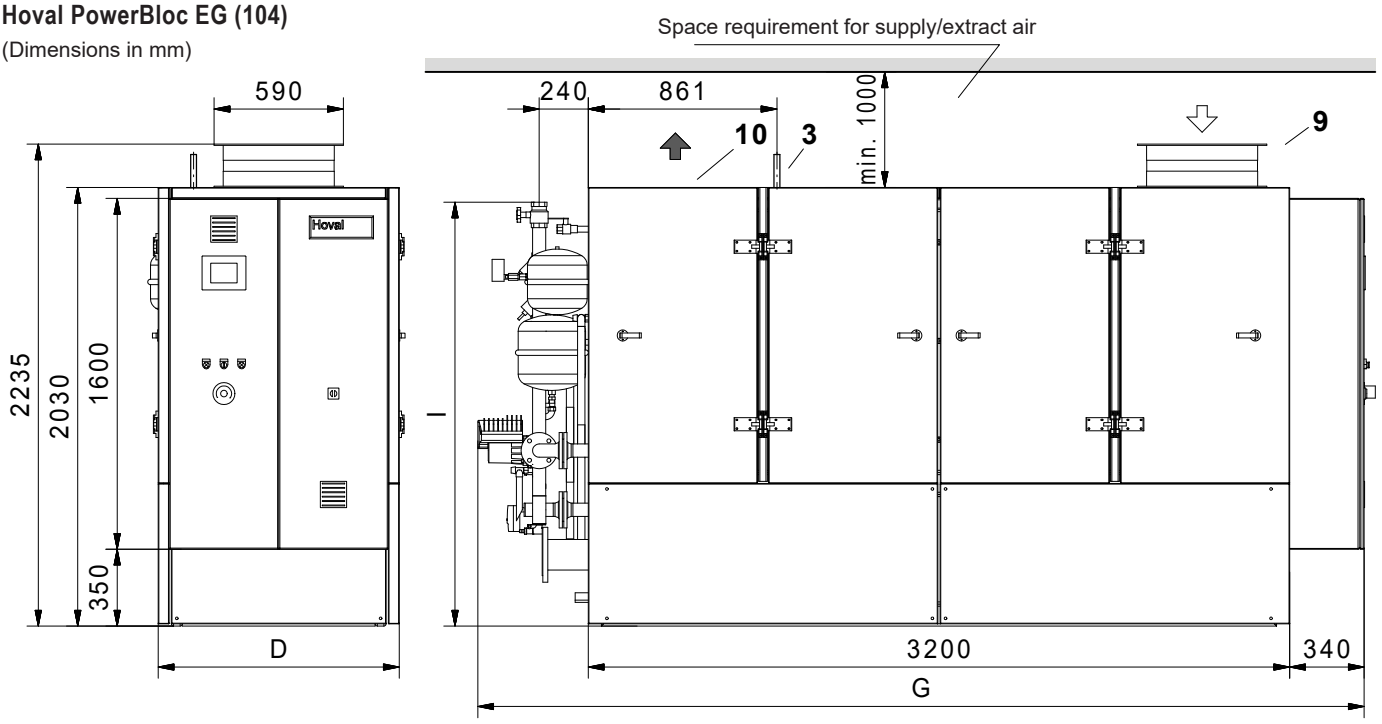


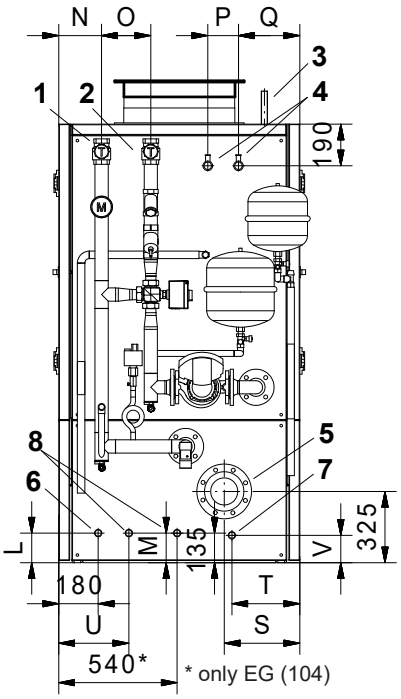
1	Heating flow	Rp 1¼"/PN 6
2	Heating return	Rp 1¼"/PN 6
3	Gas connection	1"
4	Exhaust gas connection	DN 100/PN 6
5	Condensate connection left (stainless steel)	22x1 mm
6	Condensate connection right (stainless steel)	22x1 mm
7	Drain	½"
8	Supply air	
9	Extract air	

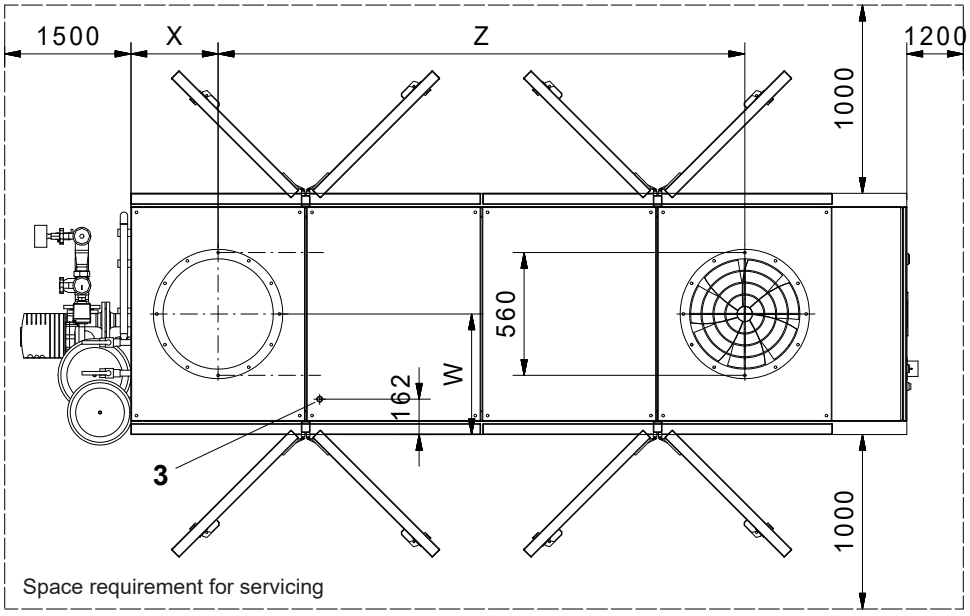
Dimensions

Hoval PowerBloc EG (104)

(Dimensions in mm)







Type EG	D	G	I	L	M	N	O	P
(104)	1160	3960	1933	125	135	196	225	140

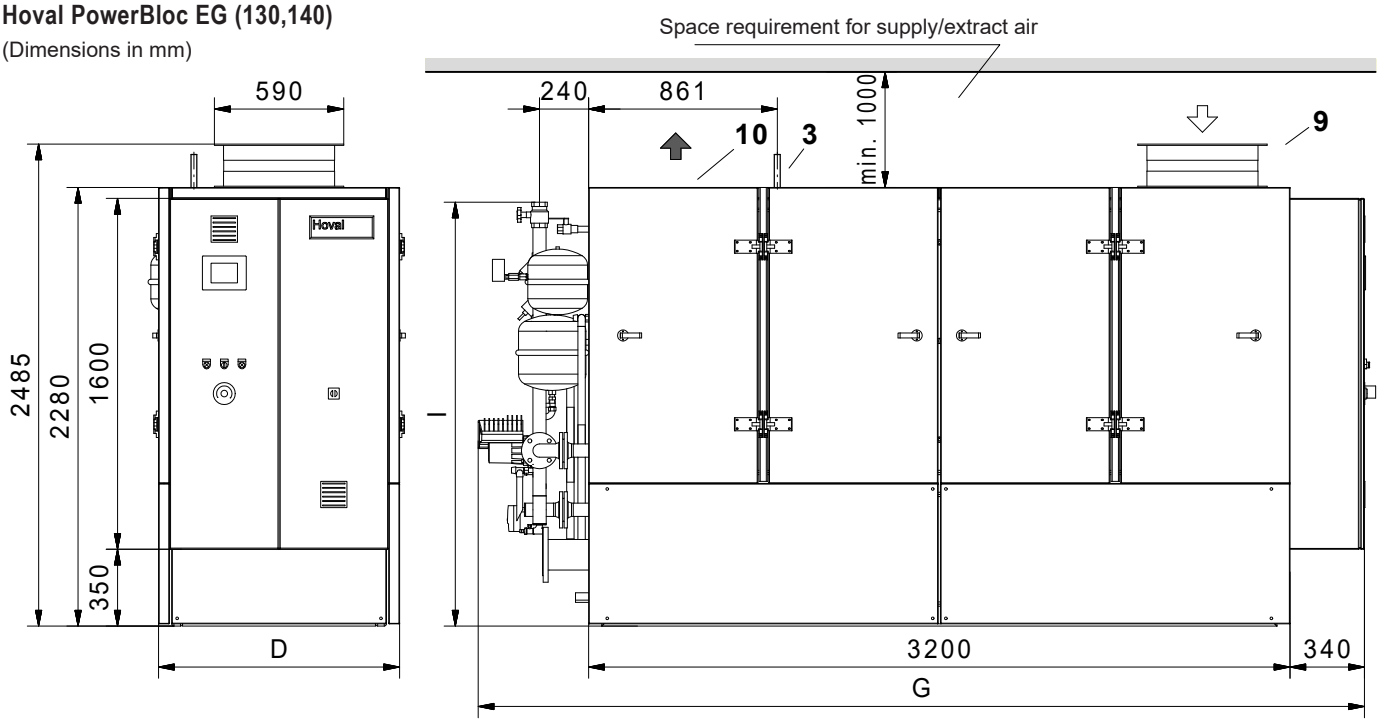
Type EG	Q	S	T	U	V	W	X	Z
(104)	280	345	310	320	125	550	398	2403

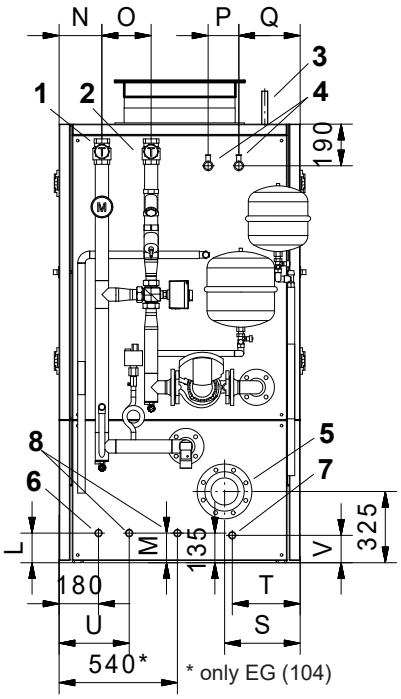
1	Heating flow	Rp 1½"/PN 6
2	Heating return	Rp 1½"/PN 6
3	Gas connection	Rp 1"
4	Mixture cooling circuit	Rp 1"/PN 6
5	Exhaust gas connection	DN 125/PN 6
6	Condensate connection left (stainless steel)	22x1 mm
7	Condensate connection right (stainless steel)	22x1 mm
8	Drain	½"
9	Supply air	
10	Extract air	

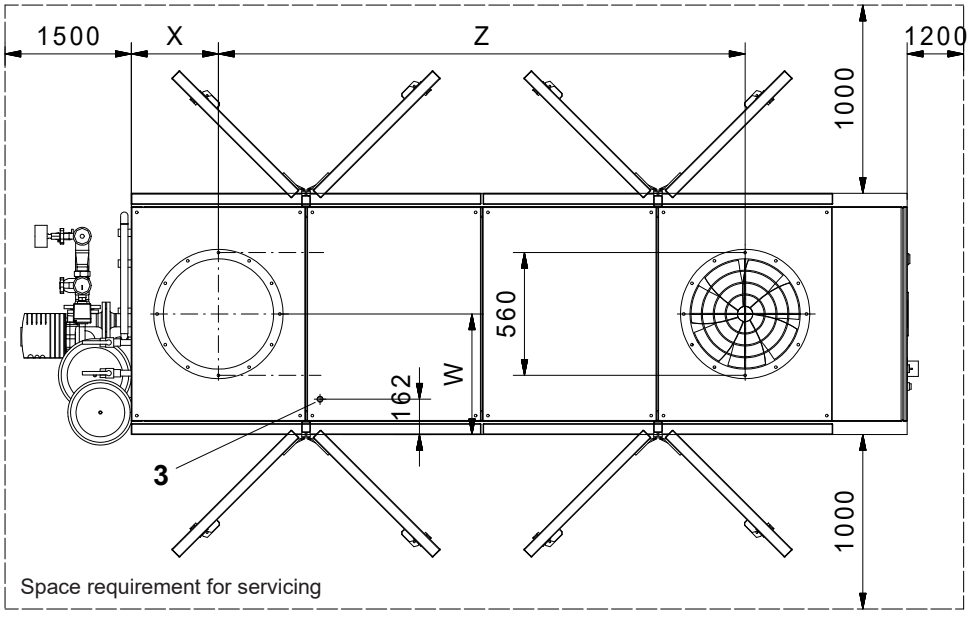
Dimensions

Hoval PowerBloc EG (130,140)

(Dimensions in mm)







Type EG	D	G	I	L	M	N	O	P
(130,140)	1360	4144	4210	125	114	252	450	-

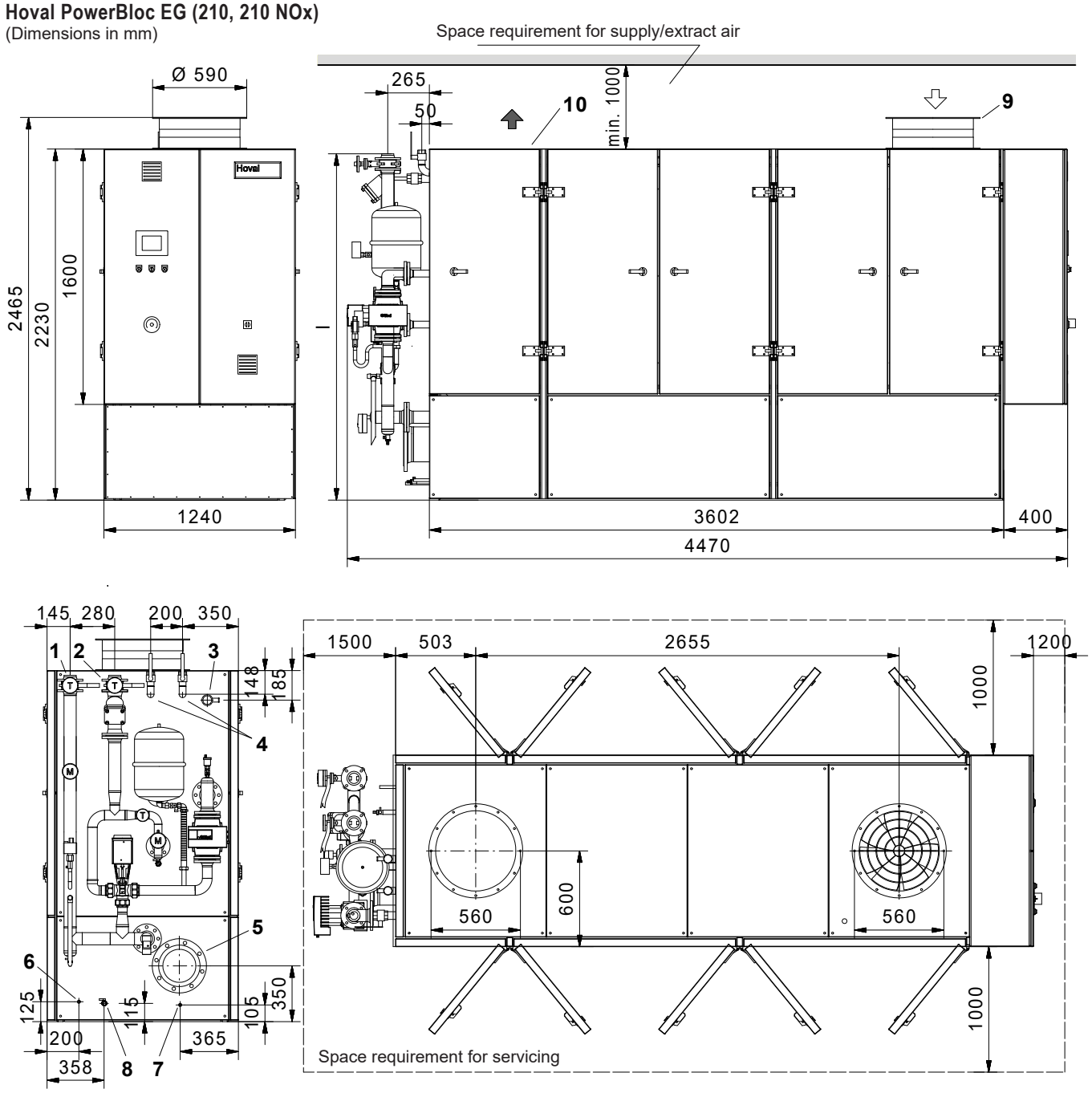
Type EG	Q	S	T	U	V	W	X	Z
(130,140)	-	335	347	328	133	630	458	2275

1	Heating flow	Rp 2″/PN 6
2	Heating return	Rp 2″/PN 6
3	Gas connection	Rp 1½″
4	Exhaust gas connection	DN 125/PN 6
5	Condensate connection left (stainless steel)	22x1 mm
6	Condensate connection right (stainless steel)	22x1 mm
7	Drain	½″
8	Supply air	
9	Extract air	

Dimensions

Hoval PowerBloc EG (210, 210 NOx)

(Dimensions in mm)



Type EG	I
(210)	2180
(210/NOx)	2170

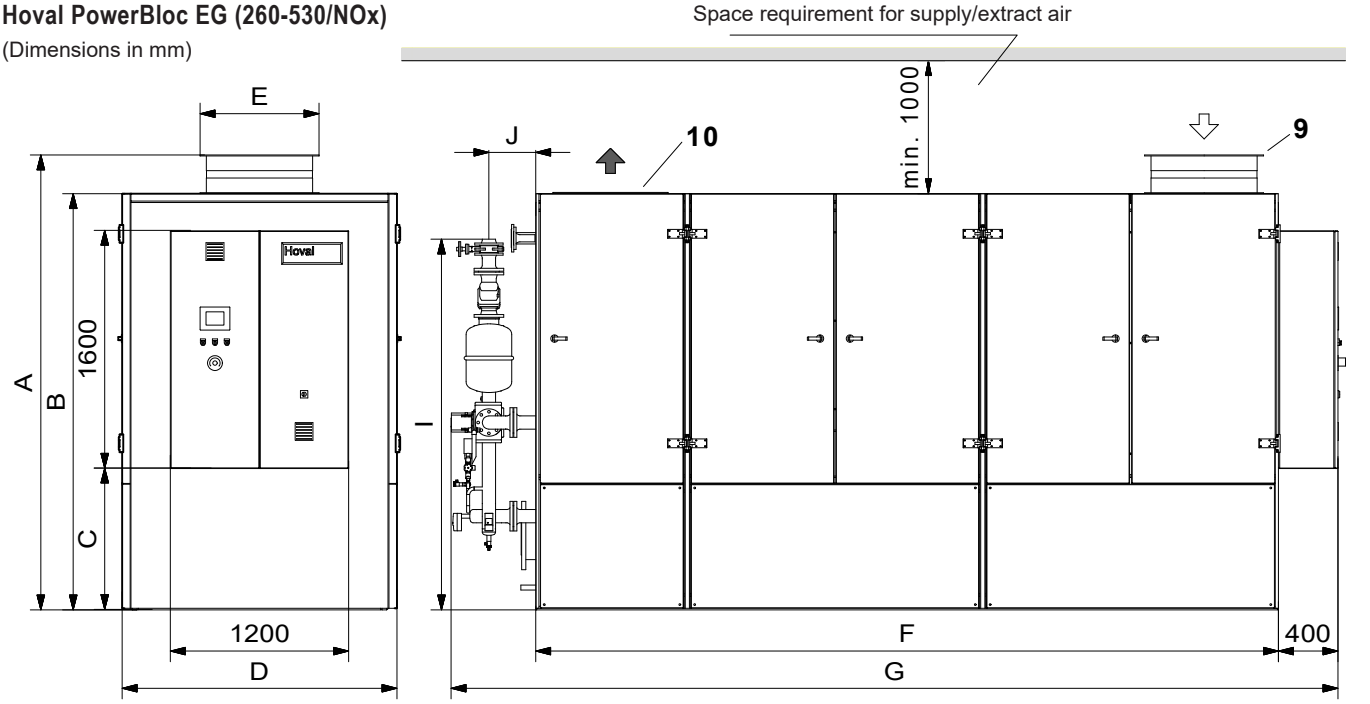
1	Heating flow	DN 65/PN 6
2	Heating return	DN 65/PN 6
3	Gas connection	Rp 1½″
4	Mixture cooling circuit only for EG (210/NOx)	Rp 1¼″/PN 6
5	Exhaust gas connection	DN 200/PN 6
6	Condensate connection left (stainless steel)	22x1 mm
7	Condensate connection right (stainless steel)	22x1 mm
8	Drain	½″
9	Supply air	
10	Extract air	

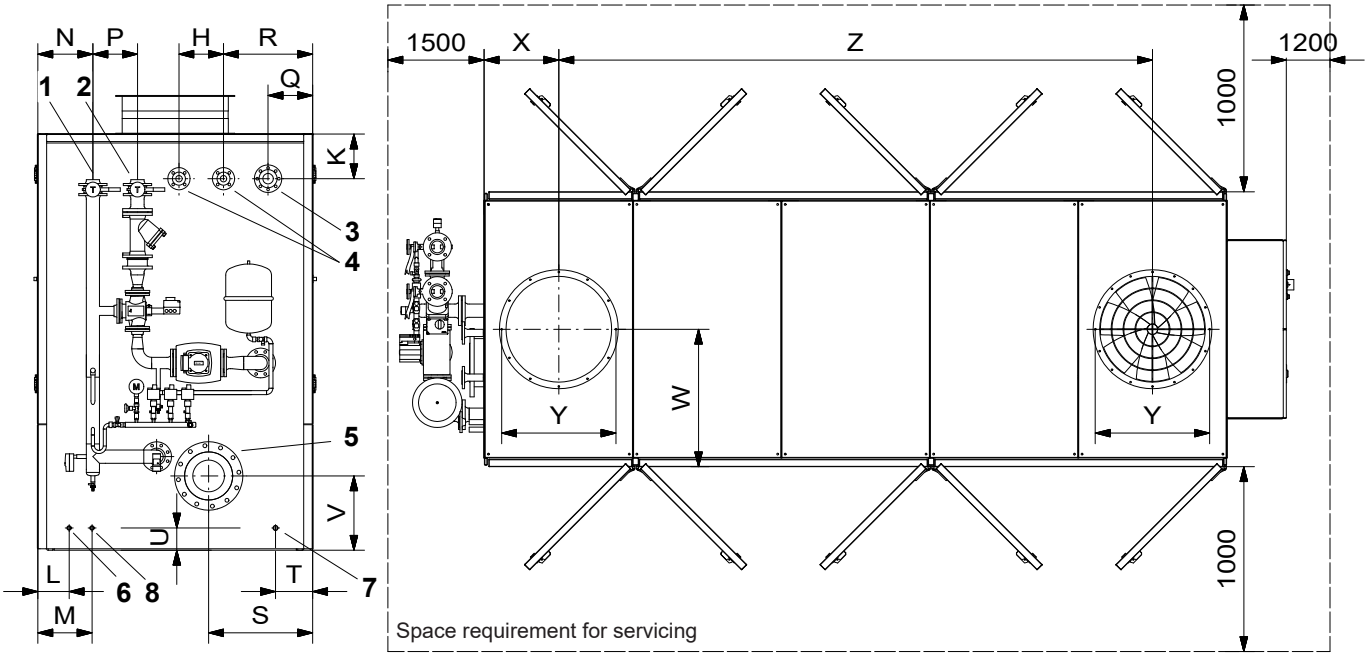
Dimensions

Connection dimensions subject to technical modifications

Hoval PowerBloc EG (260-530/NOx)

(Dimensions in mm)





Type EG	A	B	C	D	E Ø	F	G	H	I	J	K	L	M	N	P	Q	R	S	T	U	V
(260)	2465	2230	345	1640	650	3800	4720	-	2069	311	200	255	355	270	650	200	-	365	365	160	370
(305)	2765	2530	655	1640	720	4500	4820	-	2512	317	300	150	390	368	300	300	-	460	460	230	460
(355)	2765	2530	655	1640	720	4500	4820	-	2512	317	300	150	390	368	300	300	-	460	460	230	460
(430)	2765	2530	950	1760	800	5000	5680	-	2460	315	300	220	460	300	300	300	-	460	460	150	428
(530)	2890	2630	950	1890	800	5000	6120	300	2460	315	300	219	460	300	300	300	600	460	460	150	428

Type EG	W	X	Y	Z
(260)	800	380	620	3048
(305)	860	450	690	3597
(355)	860	450	690	3597
(430)	925	500	770	3996
(530)	925	500	770	3996

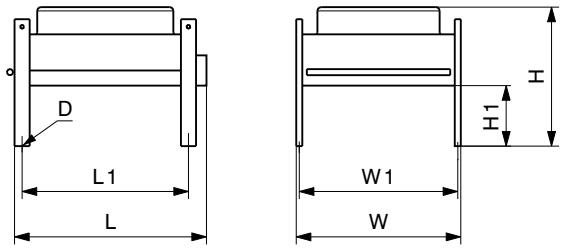
1	Heating flow	DN 65/PN 6, EG (260-355) DN 80/PN 6, EG (430-530)
2	Heating return	DN 65/PN 6, EG (260-355) DN 80/PN 6, EG (430-530)
3	Gas connection	Rp 2″, EG (260-430) DN 65/PN 16, EG (530)
4	Mixture cooling circuit	Rp 1½″, EG (305-530)
5	Exhaust gas connection	DN 200/PN 6, EG (260) DN 250/PN 6, EG (305-430) DN 300/PN 6, EG (530)
6	Condensate connection left (stainless steel)	22x1 mm
7	Condensate connection right (stainless steel)	22x1 mm
8	Drain	½″
9	Supply air	
10	Extract air	

Mixture cooling circuit only for EG (305,355,430,530)

Dimensions

Emergency cooler
for Hoval PowerBloc EG (43)

(Dimensions in mm)

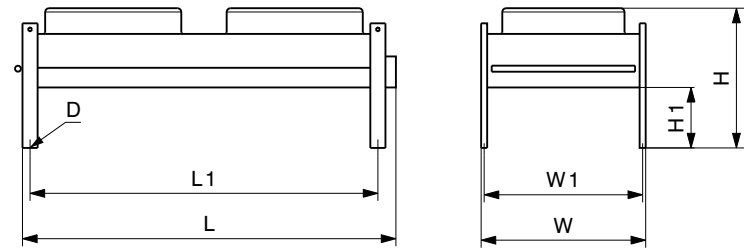


PowerBloc EG type	type	D	H	H1	L	L1	W	W1	Weight kg	Connection [1]
(43)	GFHC FD 050.1/11-42	13	919	400	1269	1100	1088	1048	103	28 x 1.5

[1] Mating flange PN 10 with soldering flange

Emergency cooler
for Hoval PowerBloc EG (50,70,104)

(Dimensions in mm)

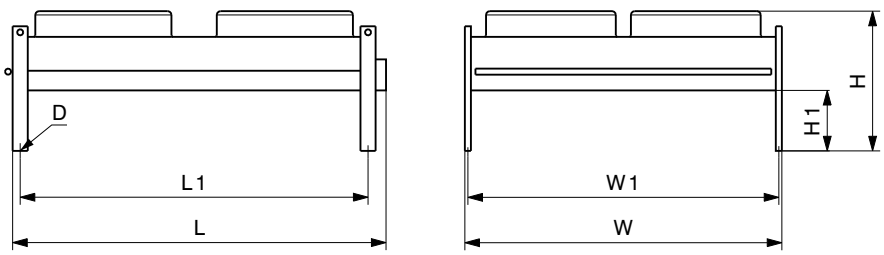


PowerBloc EG type	type	D	H	H1	L	L1	W	W1	Weight kg	Connection [1]
(50)	GFHC FD 050.1/12-44	13	919	400	1869	1700	888	848	132	35 x 1.5
(70,104)	GFHC FD 063.1/12-42	13	924	400	2469	2300	1088	1048	177	42 x 1.6

[1] Mating flange PN 10 with soldering flange

Emergency cooler
for Hoval PowerBloc EG (210,210/NOx)

(Dimensions in mm)

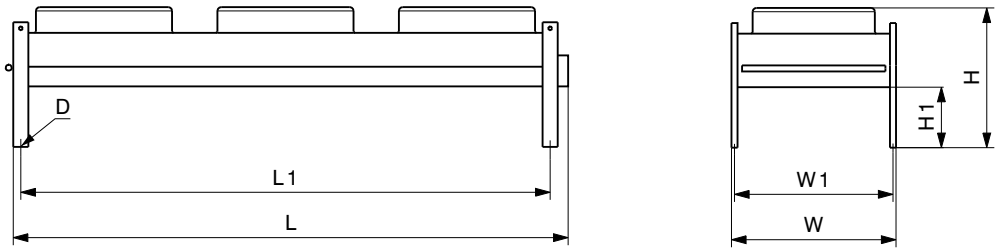


PowerBloc EG type	type	D	H	H1	L	L1	W	W1	Weight kg	Connection [1]
(210,210/NOx)	GFHC FD 063.1/22-45	13	924	400	2469	2300	2096	2056	357	54 x 2

[1] Mating flange PN 10 with soldering flange

Dimensions

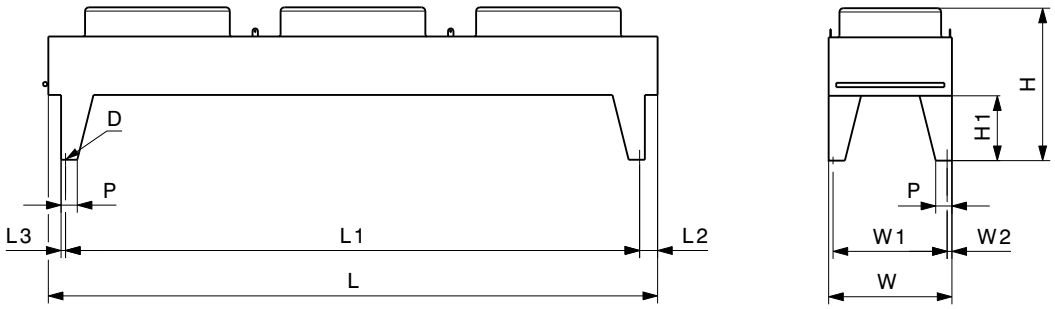
Emergency cooler
for Hoval PowerBloc EG (130,140)
(Dimensions in mm)



PowerBloc EG type	type	D	H	H1	L	L1	W	W1	Weight kg	Connection [1]
(130)	GFHC FD 063.1/13-44	13	924	400	3669	3500	1088	1048	264	54 x 2

[1] Mating flange PN 10 with soldering flange

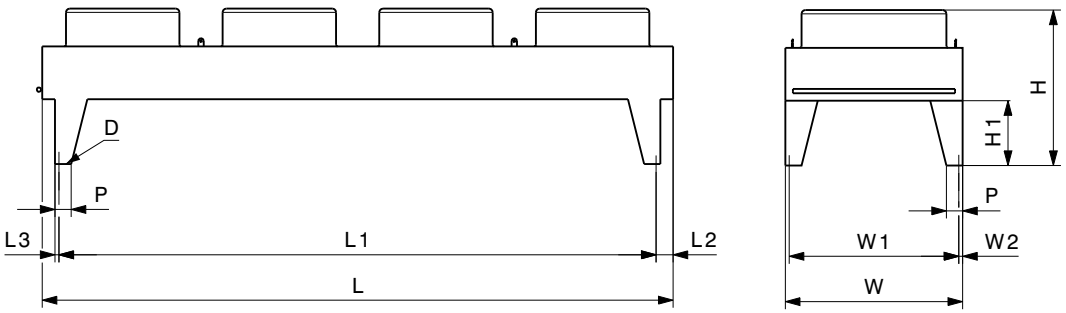
Emergency cooler
for Hoval PowerBloc EG (260,305,355)
(Dimensions in mm)



PowerBloc EG type	type	D	H	H1	L	L1	L2	L3	P	W	W1	W2	Weight kg	Connection [1]
(260,305,355)	GFHV FD 080.1 NF/13A-44	17	1411	600	5640	5300	197	52	150	1141	1037	52	680	76.1 x 2

[1] Mating flange PN 10 with soldering flange

Emergency cooler
for Hoval PowerBloc EG (305/NOx,355/NOx,430,430/NOx,530,530/NOx)
(Dimensions in mm)



PowerBloc EG type	type	D	H	H1	L	L1	L2	L3	P	W	W1	W2	Weight kg	Connection [1]
(305/NOx,355/NOx,430,430/NOx)	GFHV FD 080.1PF/14A-45	17	1439	600	5840	5500	197	52	150	1641	1537	52	826	76.1 x 2
(530,530/NOx)	GFHV FD 080.1QF/14A-45	17	1411	600	5840	5500	197	52	150	2241	2137	52	1144	88.9 x 2

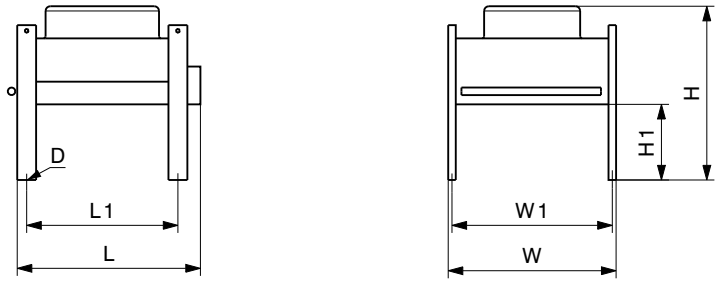
[1] Mating flange PN 10 with soldering flange

Dimensions

Mixture cooler

for Hoval PowerBloc EG (104)

(Dimensions in mm)



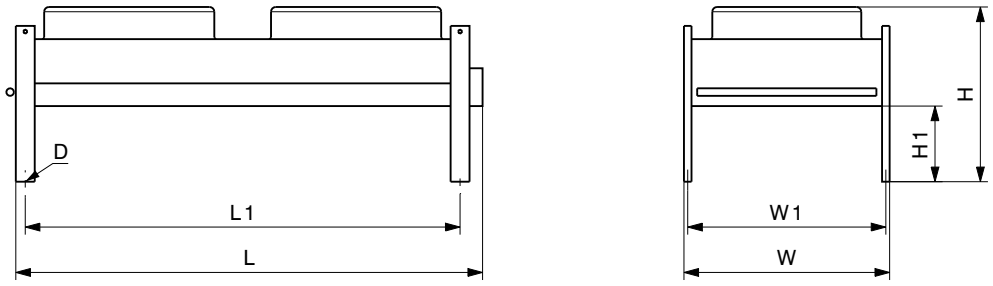
PowerBloc EG type	type	D	H	H1	L	L1	W	W1	Weight kg	Connection [1)]
(104)	GFHC FD 050.1/11-45	13	919	400	969	800	888	848	88	35 x 1.5

[1] Mating flange PN 10 with soldering flange

Mixture cooler

for Hoval PowerBloc EG (210,210/NOx,305,305/NOx,355,355/NOx,430,430/NOx,530,530/NOx)

(Dimensions in mm)



PowerBloc EG type	type	D	H	H1	L	L1	W	W1	Weight kg	Connection [1)]
(210,305,355)	GFHC FD 050.1/12-43	13	919	400	1869	1700	888	848	155	28 x 1.5
(210/NOx)	GFHC FD 050.1/12-45	13	919	400	2469	2300	1088	1048	187	35 x 1.5
(305/NOx,355/NOx)	GFHC FD 050.1/12-44	13	919	400	2469	2300	1088	1048	206	35 x 1.5
(430,430/NOx,530,530/NOx)	GFHC FD 063.1/12-41	13	924	400	2469	2300	1088	1048	226	42 x 1.6

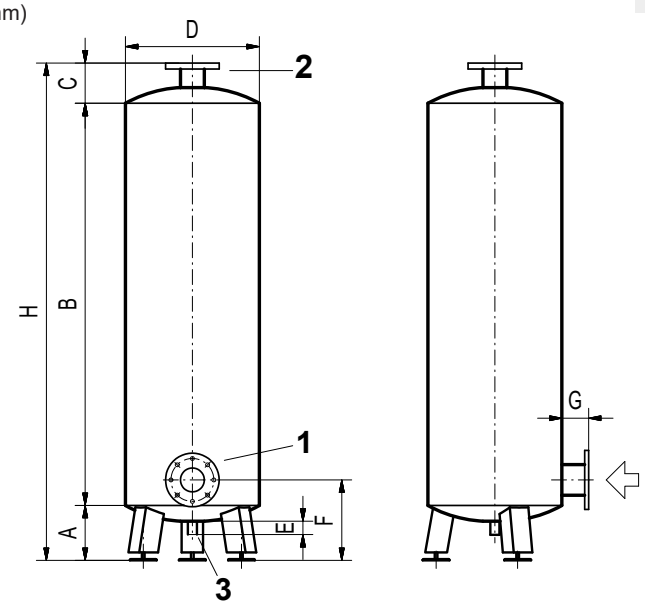
[1] Mating flange PN 10 with soldering flange

Dimensions

Low-frequency silencer S

(Dimensions in mm)

Connection dimensions subject to technical modifications



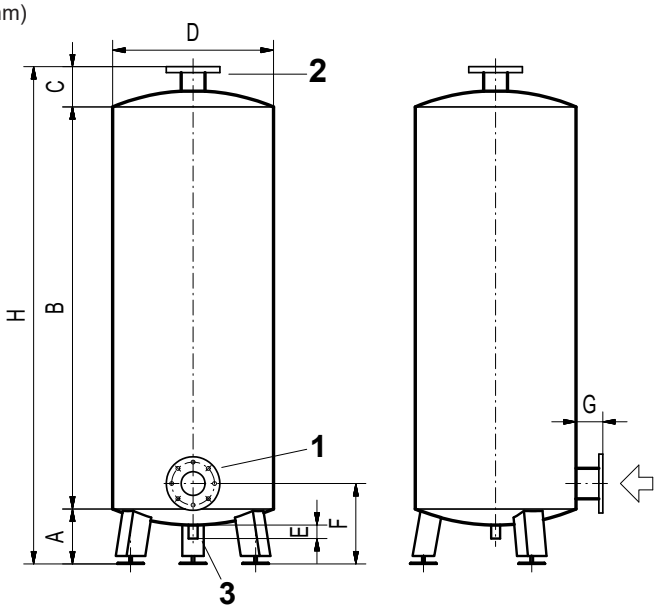
Pressure drop

PowerBloc EG type	Low-frequency silencer	Pressure drop Pa
(43)	(S-080)	33
(50)	(S-080)	45
(70)	(S-100)	25
(104)	(S-125)	53
(130,140)	(S-125)	59
(210)	(S-200)	23
(260)	(S-200)	12
(305)	(S-250)	31
(355)	(S-250)	31
(430)	(S-250)	20
(530)	(S-300)	21
(530)	(S-300)	21

PowerBloc EG type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**1** Exhaust gas inlet DN	PN	**2** Exhaust gas outlet DN	PN	**3** Condensate outlet	Weight kg
(43,50)	205	1500	150	500	50	300	100	1855	80	6	80	10	R 1″	58
(70)	210	1750	150	500	75	320	100	2110	100	6	100	10	R 1″	67
(104-140)	205	2000	150	500	95	325	100	2355	125	6	125	10	R 1″	75
(210)	300	2200	150	600	30	500	100	2650	200	6	200	10	R 1″	118
(305)	300	2250	150	650	40	500	100	2700	250	6	250	10	R 1″	131
(355,430)	300	2250	150	650	40	500	100	2700	250	6	250	10	R 1″	131
(530)	300	2500	150	650	30	520	100	2950	300	6	300	10	R 1″	148

Low-frequency silencer G

(Dimensions in mm)



Pressure drop

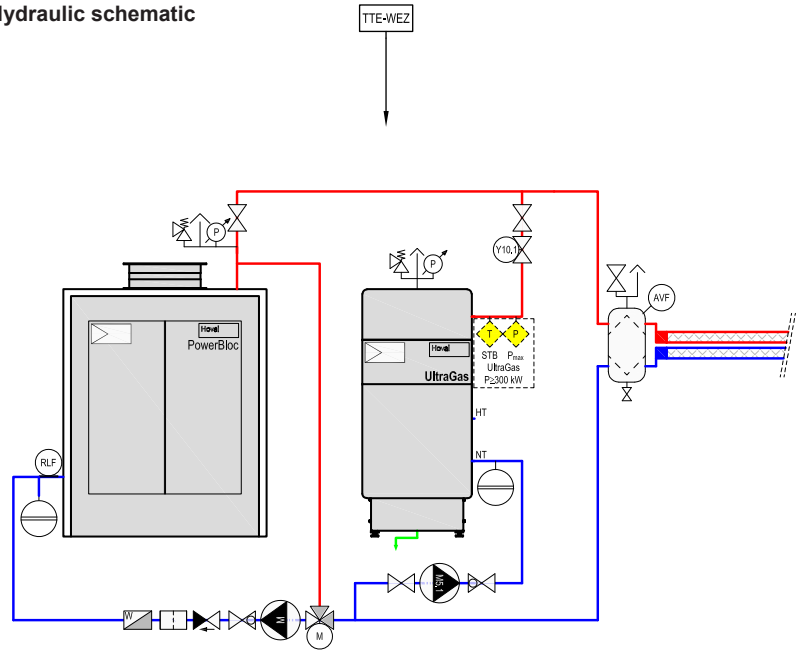
PowerBloc EG type	Low-frequency silencer	Pressure drop Pa
(43)	(G-080)	33
(50)	(G-080)	45
(70)	(G-100)	25
(104)	(G-125)	53
(130,140)	(G-125)	59
(210)	(G-200)	23
(260)	(G-200)	12
(305)	(G-250)	31
(355)	(G-250)	31
(430)	(G-250)	20
(530)	(G-300)	21
(530)	(G-300)	21

PowerBloc EG type	**A**	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**1** Exhaust gas inlet DN	PN	**2** Exhaust gas outlet DN	PN	**3** Condensate outlet	Weight kg
(43,50)	205	1500	150	600	50	300	100	1855	80	6	80	10	R 1″	112
(70)	210	1750	150	600	75	320	100	2110	100	6	100	10	R 1″	123
(104-140)	205	2000	150	600	95	325	100	2355	125	6	125	10	R 1″	139
(210)	300	2200	150	700	30	500	100	2650	200	6	200	10	R 1″	182
(305)	300	2250	150	750	40	500	100	2700	250	6	250	10	R 1″	215
(355,430)	300	2250	150	750	40	500	100	2700	250	6	250	10	R 1″	215
(530)	300	2500	150	800	30	520	100	2950	300	6	300	10	R 1″	254

Examples

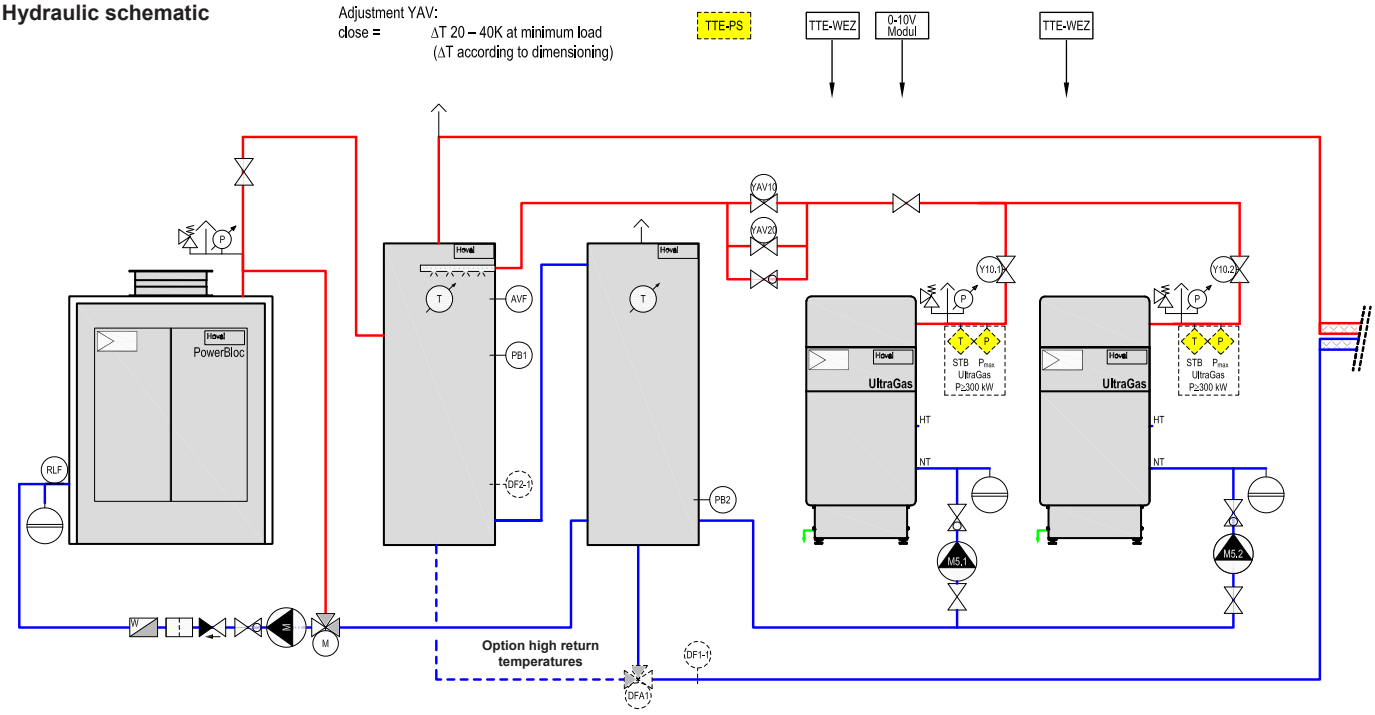
CHP plant and gas condensing boiler
- Basic load with CHP plant
- Peak load with gas condensing boiler, e.g. Hoval UltraGas®
- Hydraulic switch for heat extraction
- The plant should have a high basic load, thus ensuring constant heat consumption.
- A buffer storage tank is recommended where the usage of electricity and heat is not simultaneous.

Hydraulic schematic



CHP plant and gas condensing boiler with buffer storage tank
- Basic load with CHP plant
- Peak load with gas condensing boiler, e.g. Hoval UltraGas®
- CHP plant is switched off when buffer storage tank is charged

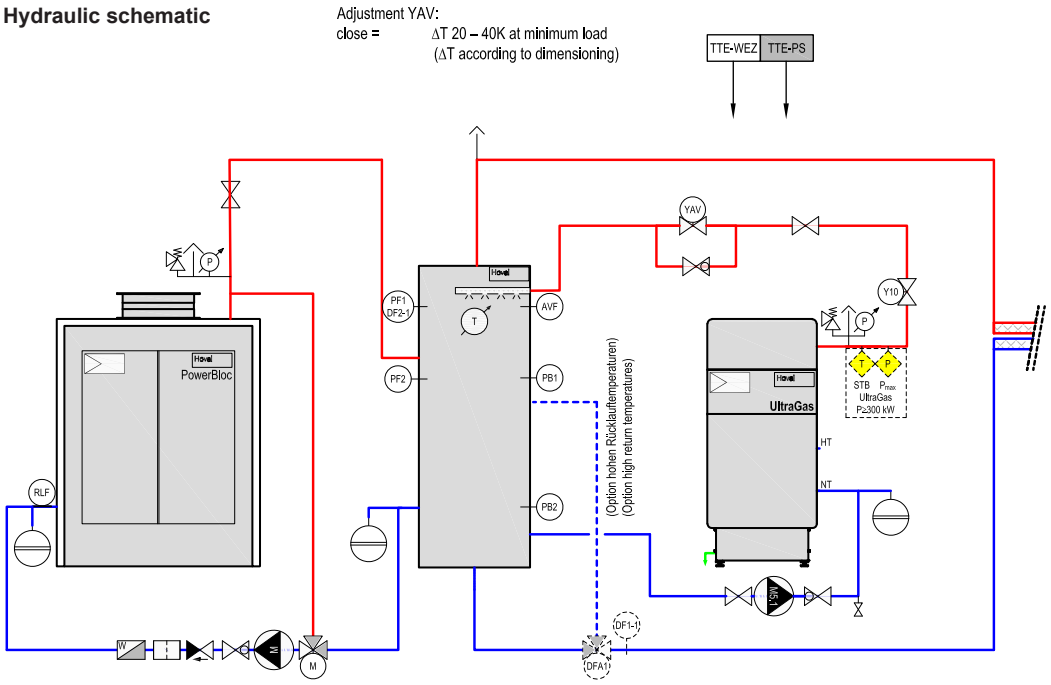
Hydraulic schematic



Examples

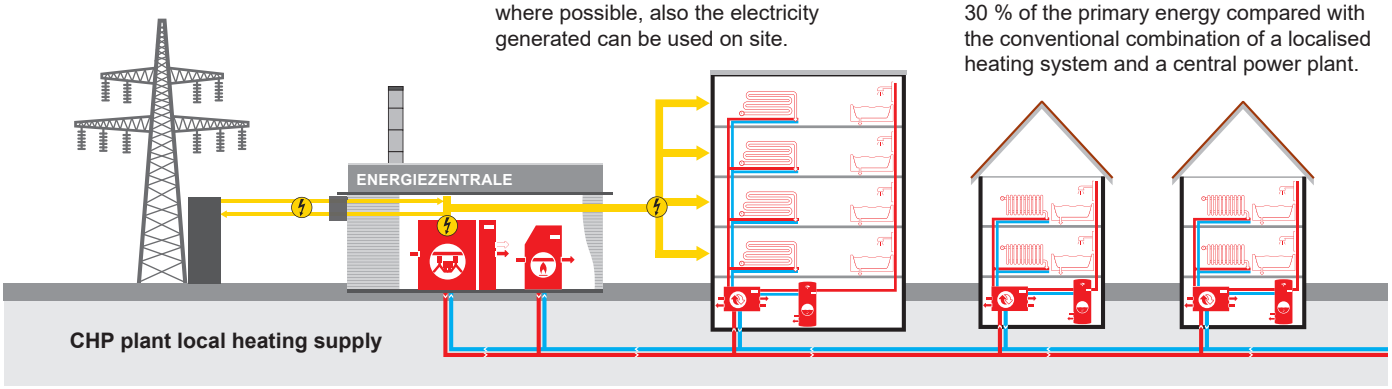
Example of PowerBloc
Buffer storage tank fill level control
The buffer storage tank fill level control is used for preventing excessive return flow temperatures flowing back to the PowerBloc (CHP plant). In addition, a minimum run time e.g. of one hour (depending on the storage tank design) is guaranteed, ensuring that the PowerBloc (CHP plant) does not cycle continuously. The PowerBloc (CHP plant) is taken out of operation when the temperature has been reached at sensor PB2. The PowerBloc (CHP plant) switches back on if the temperature drops below the value at sensors PB2 and PB1.

Hydraulic schematic



Engineering
General

General
- Hoval combined heat and power plants (CHP plants) with gas engines are modular plants for the simultaneous and efficient generation of electricity and heat.
- Careful planning and clear concepts are a precondition for designing a CHP plant and its efficiency.
- Possible objects could be, for example:
  - medium-sized and large residential buildings
  - housing estates
  - retirement and nursing homes
  - hospitals
  - schools and sports halls
  - industrial and commercial buildings
  - data processing centres and office buildings
  - sewage plants ... etc.
- CHP plants are suitable for decentralised energy supply of both new and renovated buildings.
- The essential factor is that all the heat and, where possible, also the electricity generated can be used on site.
- Arrangements for the feedback of electricity into the grid must be clarified with the responsible power station in good time.
- Depending on the size of the plant, the electricity generation efficiency can be approx. 33 to 40 %.
- Through exploitation of heat gains during electricity generation, the utilisation of the input energy can be more than 90 %.
- Heat-regulated CHP plants can save up to 30 % of the primary energy compared with the conventional combination of a localised heating system and a central power plant.



CHP plant local heating supply

Heat-regulated CHP plants
- The power output depends on the heat demand, with the greatest possible heat coverage, a high number of operating hours and, where possible, full consumption of the self-generated power.
- Surplus electricity is fed into the public grid against remuneration.
- The maintenance intervals are based on the plant operating hours.
- In addition to engineering considerations, there are also local regulations and legal requirements to be met.

Design
- This is based on the annual load curve of the heat demand. This shows how for many hours a year a specific heat output is required.
- The daily load curve of electricity demand is calculated in order to estimate the simultaneous power and heat demand.
- The rule of thumb for economical operation is: the CHP plant should cover approx. 10 to 20 % of the total energy demand and should reach at least 3500 to 5000 operating hours at full capacity per year.
- The residual heat demand is covered with peak load boilers in bivalent operation.
- Today, there are computer-aided planning programs and simulations for more precise engineering.
- As a rule, larger plants have higher efficiencies than smaller ones.
- CHP plants are usually designed with several aggregates (units).

The distribution of output over several small units means:
- Good power adjustment (high number of operating hours, economical in partial load operation)
- High availability in the event of failure of an aggregate or during maintenance work.
- Relatively high investment costs,
- Higher maintenance and installation effort

Supplying power with one large unit means:
- Usually insufficient power adjustment in partial load operation
- No availability in the event of failure of the unit
- Lower investment costs
- Lower maintenance and installation effort.

Hydraulics
- The operating mode for integration into the power supply must be clarified.
- Precise co-ordination between consumers and generator as well as between the individual heat generators, allowing for long operating times and a high number of operating hours at full capacity, is a major factor influencing cost effectiveness.

Buffer storage tank
- Depending on the plant concept, a buffer storage tank may be required for hydraulic integration.
- However, heat extraction by means of a buffer storage tank is recommended.
- It usually proves more economical to charge the tank in intermittent operation than in modulation mode.
- The storage tank volume must be selected in accordance with the engine running time, and a period of at least one hour for full loading of the tank is recommended.

Gas connection
Manual gas shut-off valve and gas filter
- A manual shut-off device (gas shut-off valve) in accordance with local requirements must be installed directly upstream of the CHP plant.
- Should local regulations or conditions require it, an approved gas filter must be installed in the gas supply line, between gas cock and CHP plant, to prevent malfunctions caused by dirt particles in the gas.
- Initial commissioning must be performed by specialist technicians from Hoval and the gas works.
- A shut-off valve must be installed upstream of every CHP plant.
- Hoval must always be consulted with regard to the exact gas quality necessary for operation of a Hoval CHP plant, and the gas quality must comply with the Hoval requirement sheet.

Combustion air
- The combustion air supply must be guaranteed.
- Ensure that the air intake can not be closed or blocked.
- see Engineering/example “Ventilation system”

Exhaust gas system
- The exhaust gas must be routed through a tested and approved exhaust gas conduit.
- Exhaust gas conduits must be gas-tight, condensate-proof and overpressure-tight.

Condensate discharge
- A permit for discharge of the exhaust gas condensate into the sewage system must be obtained from the relevant authority.
- Without neutralisation, condensate discharge is generally only permitted if the waste water pipes and the sewage system are made from plastic or ceramic material.
- If the sewage pipes are made from cement-bonded materials, intermitted discharge (without neutralisation) may be permitted for power levels up to 200 kW.

Notices
- When converting to a CHP plant, it is usually possible to continue using the existing installations after making just a few minor modifications.
- The temperature level of the heat consumers and the CHP plant must be co-ordinated.
- The simultaneous generation of energy (in the form of both electricity and heat) by a CHP plant must be noted. Summertime operation must be taken into consideration during configuration.

Exhaust gas heat exchangers
See Oil for details of downstream exhaust gas/water heat exchangers for calorific value utilisation.

Engineering

Current-regulated CHP plants
- The power output depends on the power requirement.
- Heat which cannot be used during this period is stored in a buffer storage tank for later utilisation. This operating mode is used in island grids or power networks separate from the public grid.

Grid-connected CHP plants
- The output level is specified by a central unit for multiple systems.
- This central unit performs cross-system optimisation of the deployment planning for the decentralised plants.

Imbalanced load from the power system (parallel mains operation)
Imbalanced load in emergency power supply
- According to the applicable guidelines, the loads of the building electrical system must be evenly distributed over all external phases of the electrical circuit.
- If a CHP plant is connected to this system, it measures the currents of each phase. This means imbalanced loads are also detected and monitored. The imbalanced load (differential current) is not allowed to exceed 15 % in order to protect the generator. Greater load imbalances can overheat the generator, leading to automatic deactivation by a safety stop of the CHP plant (triggering time 10 s if the differential current is exceeded by more than 15 %).
- If imbalanced loads are detected in the local power system, the building system must be checked and the loads causing the imbalance must be connected to the power system in such a way that the imbalanced loading of the phases is avoided.

Partial load and isolated operation
For partial load operation, the following should be considered:
Load profile – conditions/restrictions:
- **> 60 % of nominal load**
  - Generally, no limitations
- **> 30 % and < 60 % of nominal load**
  - max. 300 h/a not exceeding 5 h at a time
  - Determination of oil lifetime on the basis of oil analyses (in accordance with operating manual / TUC 13.036)
  - The oil service life can be expected to be shorter.
- **< 30 % of nominal load**
  - To be avoided in general. Possible for a short time (max. 5 minutes).
- At low load profiles < 30 %, there is an increased condensate accumulation in the oil system. This accelerates the ageing of the oil. To ensure complete combustion and avoid deposits in the combustion chamber, the ignition system control must be adapted according to the load profile. It must be ensured that the emissions in accordance with the country-specific clean air ordinances are complied with at each load point. Please consider this in your maintenance schedule.
- After each partial load phase < 60 %, the motor must be operated at nominal load (100 %) for at least 1 h.

Requirements and directives
The following requirements and directives must be complied with:
- Country-specific laws, regulations, directives and recommendations, both national and regional, must always be observed.
- Technical information and installation instructions from Hoval.
- Hydraulic regulations and those pertaining to instrumentation and control.
- In the case of bivalent plants, the engineering guidelines for the corresponding supplementary heat generator must be observed.
- EN 12828 Heating systems in buildings
- A permit for discharge of the exhaust gas condensate into the sewage system must be obtained from the relevant authority.

Electrical connection
- European and country-specific laws, regulations, directives and recommendations, both national and regional, must always be observed.
- Regulations of the local power station

Water quality
Heating water (on the secondary side)
ÖNORM H5195, European Standard EN 14868 and VDI Guideline 2035 must be complied with.
- Hoval heat generators and calorifiers are suitable for heating systems without significant oxygen intake (system type I in accordance with EN 14868).
- Systems with
  - continuous oxygen intake (e.g. underfloor heating systems without diffusion-proof plastic piping) or
  - intermittent oxygen intake (e.g. requiring frequent topping-up)

  must be equipped with **separate circuits**.
- Treated heating water must be tested at least once per year, or more frequently if prescribed by the manufacturer of the inhibitor.
- In the case of existing systems (if, for example, the heat generator is replaced), where the quality of the existing heating water meets the requirements of VDI 2035, re-filling of the system is not recommended. The requirements of VDI 2035 also apply to replacement water.
- Before filling new systems and, where necessary, existing systems, the heating system must be professionally cleaned and flushed! The boiler must not be filled until the heating system has been flushed.
- All parts of the heat generator/calorifier which come into contact with water are made of ferrous materials and stainless steel.
- Due to the danger of stress corrosion in the stainless steel section of the heat generator, the sum of the chloride, nitrate and sulphate contents of the heating water must not exceed a total of 50 mg/l (ÖNORM H5195 stipulates that the limit value for chlorides is 30 mg/l).
- The pH value of the heating water should be between 8.3 and 9.5 after 6 to 12 weeks of heating operation.

Filling and replacement water
- As a rule, untreated mains water is best suited as filling and replacement water for a system with Hoval heat generators. However, the quality of the untreated domestic water must still meet the requirements of VDI 2035 or be demineralised and/or treated with inhibitors. The requirements of EN 14868 must be met in this context.
- To maintain high heat generator efficiency and prevent overheating of the heating surfaces, the values in Table 1 should not be exceeded, taking into consideration the output (smallest individual heat generator in cascades) and the water content.
- The total quantity of filling and replacement water added to the heat generator over its service life must not be higher than twice the system water content.

Foundation slab
Hoval PowerBloc modules have decoupled mounting of the machinery set internally. This means special foundations are generally not required.
The load-bearing capability of the existing ground must be adequate for the CHP plant.

Engineering
Requirements for the filling water / Plate heat exchanger (copper-soldered)

Requirements for the filling water

Table 1: Maximum filling quantity without/with demineralisation

	Total hardness of the filling water up to...							
[mol/m³] [1]	< 0.1	0.5	1	1.5	2	2.5	3	>3.0
f°H	< 1	5	10	15	20	25	30	>30
d°H	< 0.56	2.8	5.6	8.4	11.2	14.0	16.8	>16.8
e°H	< 0.71	3.6	7.1	10.7	14.2	17.8	21.3	>21.3
~mg/l	< 10	50.0	100.0	150.0	200.0	250.0	300.0	>300
Conductance [2]	< 20	100.0	200.0	300.0	400.0	500.0	600.0	>600
Size of the individual boiler	**maximum filling quantity without demineralisation**							
50 to 200 kW	NO RE-		50 l/kW	20 l/kW	20 l/kW			
200 to 600 kW	QUIRE-	50 l/kW	50 l/kW	20 l/kW	ALWAYS DEMINERALISE			
over 600 kW	MENT							

[1] Total alkaline earths
[2] If the conductance in µS/cm exceeds the value shown in the table, water analysis is necessary.

Plate heat exchanger (copper-soldered)

Water quality of CHP plant heating circuits (on the primary side)

These technical specifications apply exclusively to the water quality in the primary circuits into which the heat exchangers are integrated.
The specified water quality must be observed in order to prevent damage - in particular in the case of cooling water and exhaust gas heat exchangers - which may result from inferior water quality.

Trisodium phosphate should be used as an alkalising agent for the replacement and initial filling water.
If there is a frost hazard for the heating circuit, specialist companies for the cooling medium must be consulted. The application limits specified by the manufacturers of these products must be adhered to (temperature, concentration, ...).
When adding large amounts of replacement water, but at least once per year, a professional water analysis should be commissioned to check the status of the water.
If necessary in order to comply with the values listed below, a specialist company should be commissioned to treat the water.

These limit values must be allowed for when designing the system.

Property	ID	Unit	Limit
pH value at 25 °C			9-10.5
Electric conductance		µS	< 100
Oxygen	O2	mg/l	< 0.05
Chloride		mg/l	< 20
Copper	Cu	mg/l	< 0.05
Total iron	Fe	mg/l	< 0.05
Alkaline earths		mmol/l	< 0.02
Total hardness		°dH	< 0.1
Phosphate	PO4	mg/l	5-10

Please note!

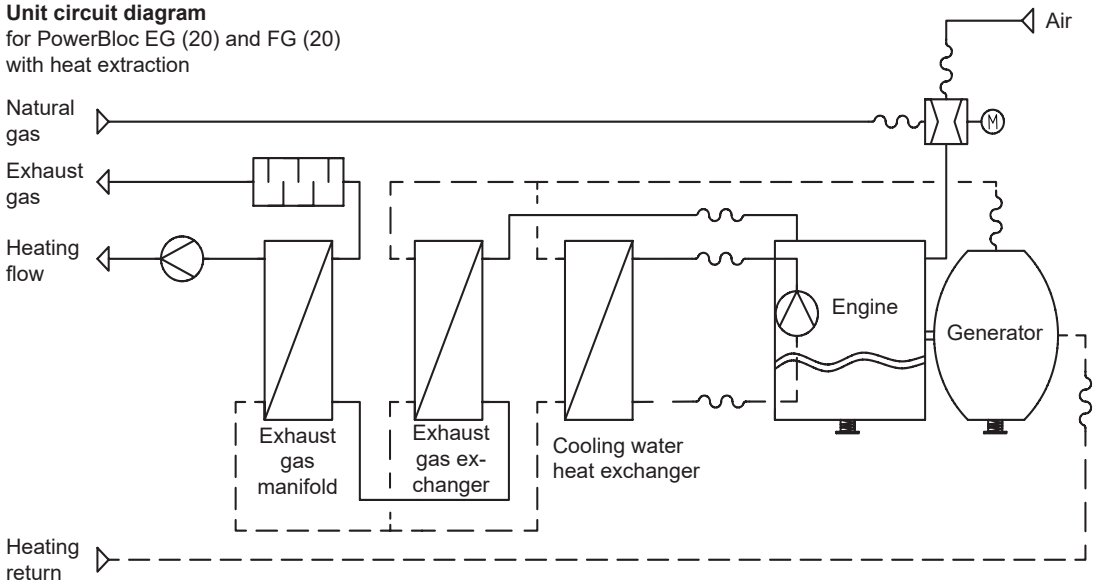
If domestic hot water calorifiers are heated with the circulation water, the pH value must be limited to a maximum of 9.5 and the phosphate concentration to 6.7 mg/l PO4 (5 mg/l P2O5 and 2.2 mg/l P respectively) in accordance with the German Drinking Water Ordinance (TVO) of 21.05.2001, or any specifications deviating from these but valid in other countries must be observed.

Suspended particles and limescale form deposits on the heating surfaces of the heat exchangers. Heat transfer is impaired and corrosion damage results. For this reason, deposits of any kind on the heating surfaces must be prevented.

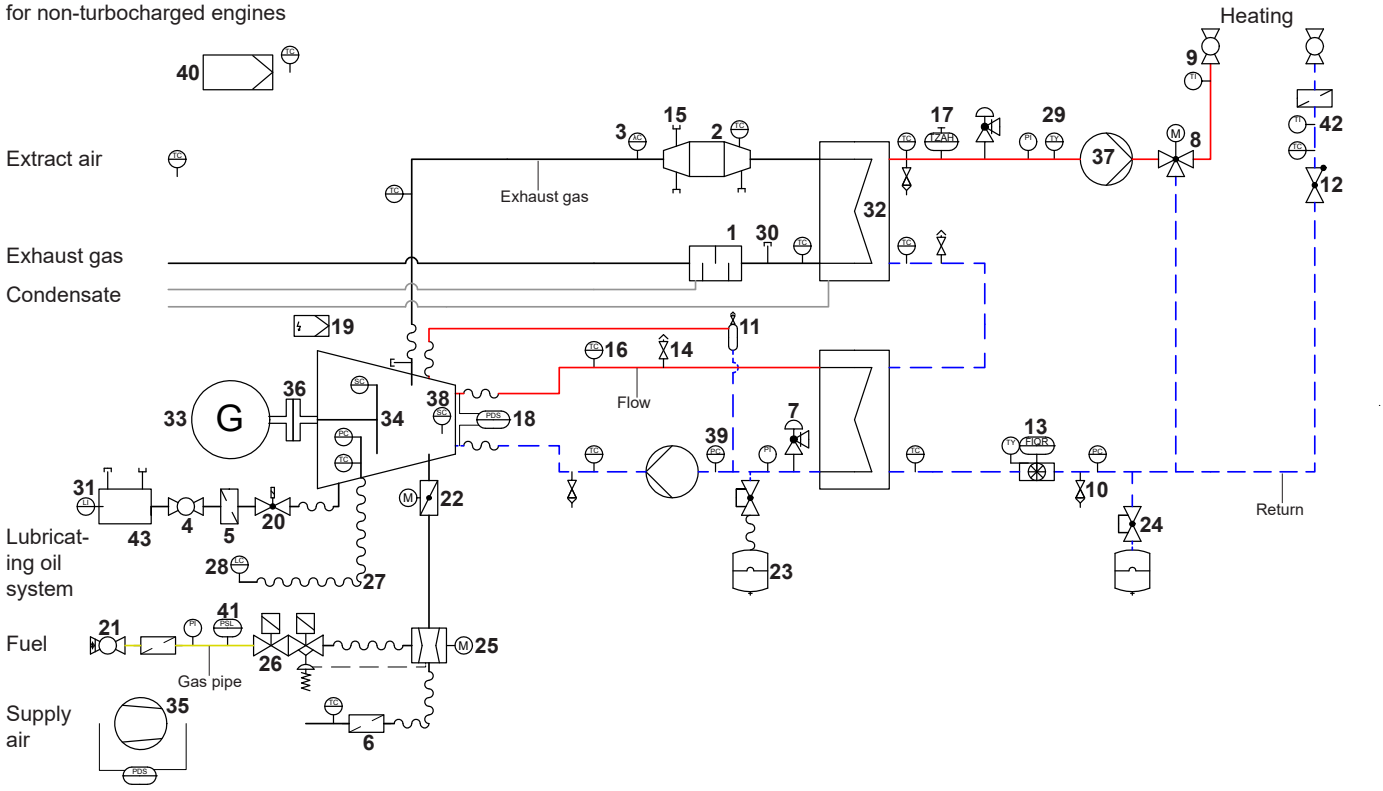
Deposits destroy the heating surfaces within a very short time!

Engineering
Unit circuit diagrams

Unit circuit diagram
for PowerBloc EG (20) and FG (20)
with heat extraction



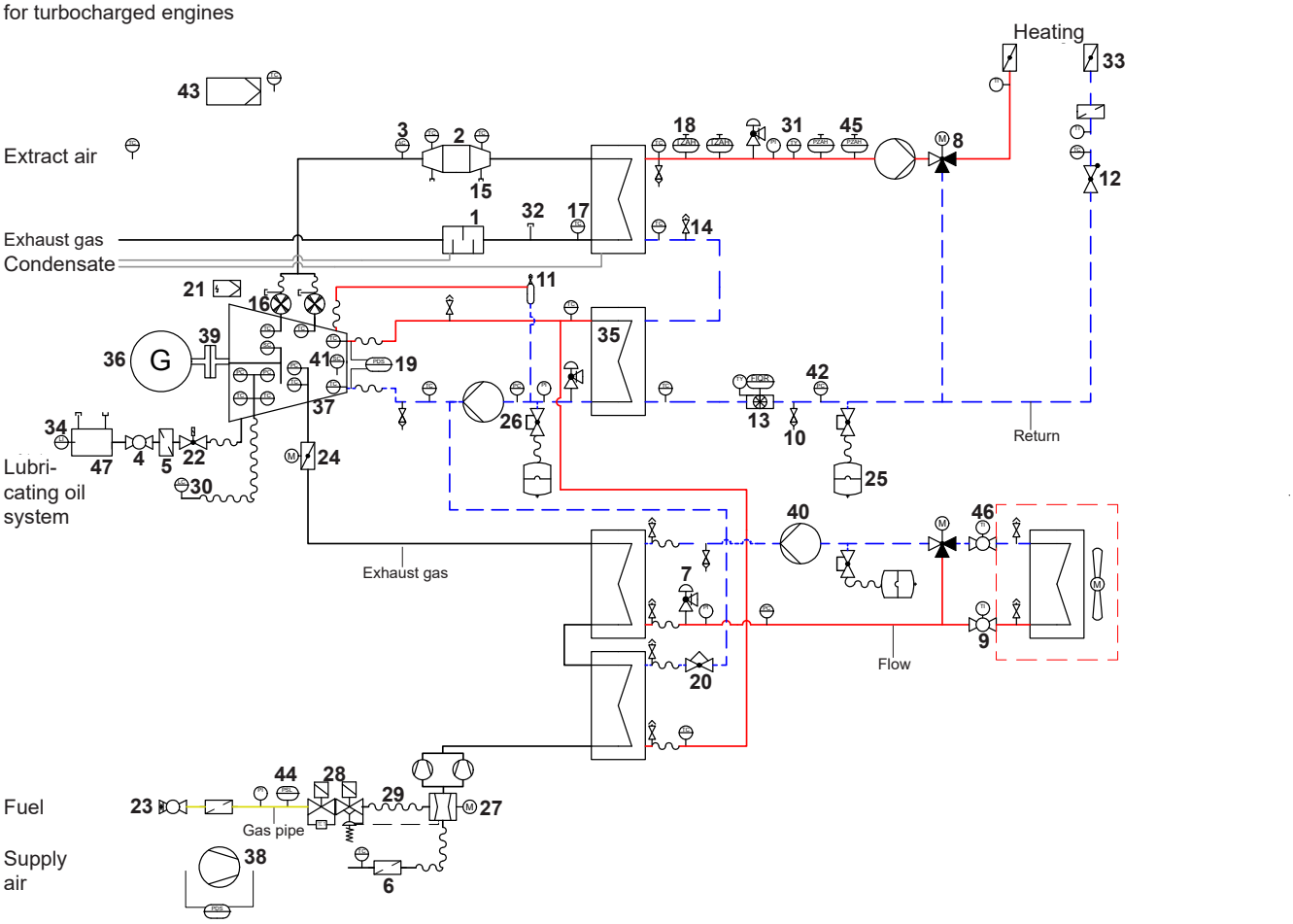
Unit circuit diagram
for non-turbocharged engines



1 Silencer
2 Catalyst
3 Lambda sensor
4 Ball valve
5 Strainer
6 Air filter
7 Diaphragm safety valve
8 Three-way valve without SF
9 Ball valve with thermometer
10 Draining
11 Air separator with pot
12 Non-return valve
13 Heat meter with integrated temperature sensor
14 Air-venting
15 Pipe end Rp (internal pipe thread) with plug
16 Temperature sensor
17 Safety temperature limiter max.
18 Differential pressure switch
19 Ignition control (ignition system)
20 Solenoid valve
21 Ball valve with thermal protection
22 Shut-off damper with motor drive
23 Expansion tank
24 Cap valve
25 Gas mixer
26 Double solenoid valve with pressure regulator
27 Line, flexible
28 Filling level sensor
29 Temperature sensor for heat meter
30 Pipe end R (external pipe thread) with cap
31 Fill level indicator
32 Heat exchanger
33 Generator
34 Motor
35 Fan
36 Coupling
37 Pump
38 Speed sensor
39 Pressure sensor
40 DDC controller
41 min. pressure monitor
42 Thermometer
43 Tank

Engineering

Unit circuit diagram
for turbocharged engines



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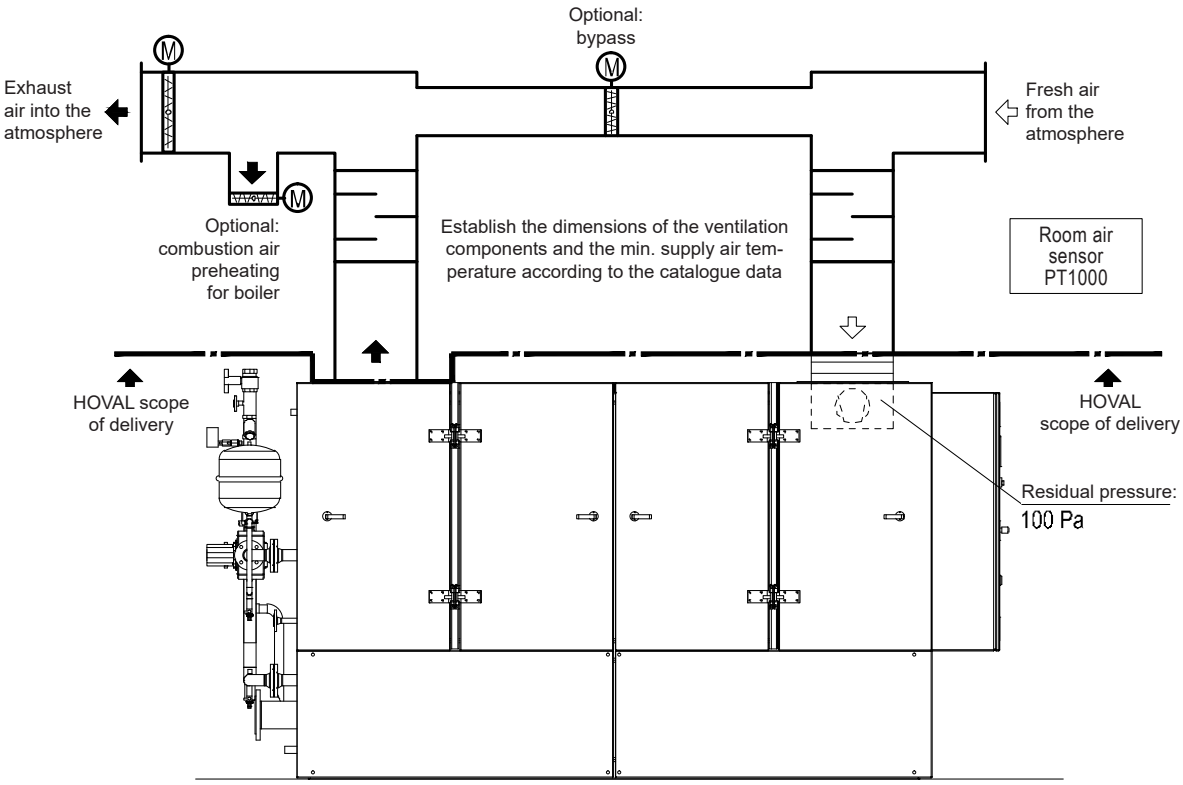
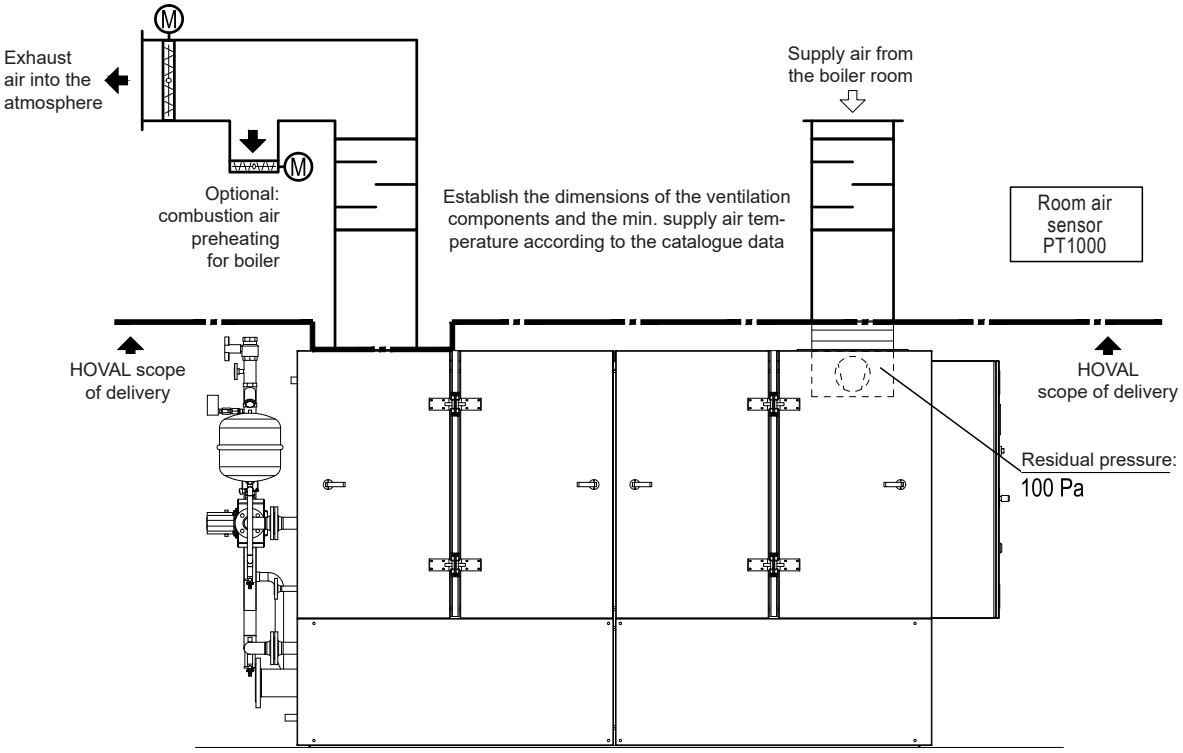
11 Air separator with pot
12 Non-return valve
13 Heat meter with integrated temperature sensor
14 Air-venting
15 Pipe end Rp (internal pipe thread) with plug
16 Turbine
17 Temperature sensor
18 Safety temperature limiter max.
19 Differential pressure switch
20 Volume flow limiter
21 Ignition control (ignition system)
22 Solenoid valve
23 Ball valve with thermal protection
24 Shut-off damper with motor drive
25 Expansion tank
26 Cap valve
27 Gas mixer
28 Double solenoid valve with leak monitor and pressure regulator
29 Line, flexible
30 Filling level sensor
31 Temperature sensor for heat meter
32 Pipe end R (external pipe thread) with cap
33 Shut-off damper
34 Fill level indicator
35 Heat exchanger
36 Generator
37 Motor
38 Fan
39 Coupling
40 Pump
41 Speed sensor
42 Pressure sensor
43 DDC controller
44 min. pressure monitor
45 max. safety pressure limiter
46 Thermometer
47 Tank

Engineering
Examples CHP plant supply/extract air

Supply air from the atmosphere



Exhaust air into the atmosphere



Description of delivery scope

Check visit before commissioning

- Prior to commissioning, inspect the system and check that:
  - all equipment is present
  - all equipment has been professionally installed
  - all media connections have been established and that the corresponding media are available
- Any defects/shortcomings are documented and must be remedied on site before commissioning.

Ancillary conditions

- The client or a representative authorised by the client must be present or available on site.

Obligatory commissioning

Description

- Obligatory commissioning and adjustment in accordance with the scope of delivery.
- The registration form should be sent to Hoval 15 working days prior to commissioning.

Scope of services

- Commissioning of the CHP plant with control and regulation systems takes approx. 2 working days.
- Initial adjustment of the system including recording and logging of the most important process data.
- When all assemblies have been adjusted, the system is inspected and approved by the energy supply company and the operator of the plant receives instruction in its use.
- Commissioning is concluded with acceptance of the plant by the client.
- Formal acceptance is required.
- If the client fails to carry out acceptance of the system within a reasonable period of time, despite being repeatedly requested to do so by the supplier, acceptance shall be deemed to have been granted.
- The operating risk is transferred to the system operator after such acceptance.
- Initial filling of the unit (lubricating oil, engine cooling water, frost protection and anti-corrosion agent, battery acid) is included in commissioning.

Ancillary conditions

- It must be ensured prior to commissioning that all preconditions for subsequent operation have been met, for example:
  - professional electrical and heating installation of the plant including air-bleeding
  - quality and quantity of the gas supply
  - sufficient load and transfer of current and heat
  - availability of the corresponding auxiliary and operating materials, in as far as they are not included in the supplier's scope of delivery.
- If these conditions are not met, all resulting costs and disadvantages will be borne by the client.
- For commissioning/acceptance, the engineering setpoints of the plant must be known, and the following persons must be present:
  - Installer: to inspect the heating-side installation.
  - Electrician: to inspect the electrical installation.
  - Representatives of the electricity and gas works
  - Hoval service technician: for commissioning and documentation of the plant components supplied by Hoval.
- Commissioning comprises only one visit to the installation site by the technician.
- Any further visits which may become necessary will be invoiced to the client.

Any additional outlay will be invoiced to the client.

Notices

- The installer/planner of the plant is responsible for the operating instructions and instructions for equipment from third-party manufacturers and the overall plant!
- All Hoval conceptual drawings and engineering guidelines serve as aids during planning. The planner of the plant is responsible for its correct functioning.

Modular version

Delivery

- Transport by lorry – without unloading
- For the weight of the CHP plant, see the technical data.
- Unloading and transport to the installation site is not included in the scope of services and must be organised on site by the client.

Ancillary conditions

- The situation on site must be clarified by Hoval
- Access for heavy goods vehicles must be provided, and the access route must be kept free of obstructions.
- The installation site must be prepared for the installation of the CHP plant.

Any additional outlay will be invoiced to the client.

Unloading and transport to the installation site

- Unloading from the delivery vehicle and transport to the installation site.
- The unit is transported at ground level on a paved transport route over a maximum distance of 50 m, set up and aligned on foundations to be provided on site.
- This item includes the required transport and lifting aids.
- Where the distance to the installation site is long or obstacles such as steps or installation shafts have to be overcome, an appropriate fee will be charged.
- The CHP unit is delivered as a complete unit and must be installed as such.
- See Dimensions for the dimensions of the CHP unit.
- Installation of the heating armature groups for heat extraction with return flow temperature increase.

Ancillary conditions

- Access for heavy goods vehicles must be provided, and the access route must be kept free of obstructions.
- The corresponding requirements with respect to access openings, routes and load-bearing capacity must be met.

Any additional outlay will be invoiced to the client.

Containerised version

Weather-proof version designed for outdoor installation.

- Scope of services and ancillary conditions are the same as for the modular version.

1. General

1.1 The following Terms and Conditions shall apply to all our present and future contracts for deliveries and other services (even if the said Terms and Conditions are not specifically mentioned in verbal, telephonic or fax communications).

1.2 All deviations from the present Terms and Conditions, ancillary verbal agreements and subsequent contractual amendments shall only be valid if they have been confirmed by us in writing.

1.3 Buying terms and conditions of the client shall not be valid even if they are not specifically rejected by us. Our Standard Terms and Conditions of Delivery shall be regarded as accepted at the latest upon receipt of our goods and services by the client.

1.4 If a provision of the present Terms and Conditions of Delivery proves to be wholly or partially invalid, the contracting parties shall replace the aforesaid provision by a new provision which comes as close as possible to the legal and economic intention of the invalid provision.

2. Offers

2.1 Our offers shall be subject to change without notice.

2.2 Orders shall only be regarded as accepted when they have been confirmed by us in writing.

2.3 Illustrations, drawings and all technical details in catalogues and printed material shall be approximate values as customary within the industry. They shall only be binding if specific reference is made to them in the contract. We shall also reserve the right to make technical and design changes after the conclusion of the contract.

2.4 Cost estimates, drawings and other documents shall remain our property and shall be subject to copyright protection; they may not be made available to third parties.

3. Regulations in the country of destination

3.1 At the latest at the time of the order, the buyer shall draw our attention to the regulations and standards in force in the country of destination relating to the design of the delivered goods and the operation thereof and also to the execution of services.

3.2 Our deliveries and services shall comply with the regulations and standards in the country of destination provided the buyer has drawn our attention thereto in accordance with Section 3.1.

3.3 The buyer shall duly inform us of any special application features of goods ordered from us if these differ from our general recommendations.

4. Prices

4.1 Our prices shall be ex works, net, excluding packaging.

4.2 All ancillary costs, e.g. freight, insurance, export, transit, import and other approvals, licenses and authentications, shall be for the account of the buyer. The buyer shall also bear all taxes, charges, customs duty, etc., which are levied in connection with the contract.

4.3 We shall reserve the right to make price adjustments if wage rates or material prices change between the date of the order confirmation and the contractual performance of the contract. Price increases shall normally be notified three months in advance. We shall be bound to the price stated in the order confirmation for a period of three months after the effective date of the price increase.

5. Payment terms

5.1 Unless otherwise agreed in writing, our invoices shall be payable within thirty days with no cash discount. Payment shall be deemed to have been made when the amount in question is at our unrestricted disposal on our account in Swiss Franks.

5.2 Payment dates shall be observed even if any delays whatsoever occur after shipment of the goods from our works. The buyer shall not be permitted to reduce or withhold payments on account of complaints or counterclaims not recognised by us.

5.3 Payments shall also be made if insignificant components are missing but usage of the delivered goods is not rendered impossible as a result or if rectification work has to be carried out on the delivery. We shall be entitled to reject rectification of the defect as long as the buyer has not discharged his/its obligations to us.

5.4 If the buyer fails to comply with the agreed payment dates, default interest shall be paid from the agreed due date without a reminder being issued; the aforesaid interest shall be based on the interest rates prevailing at the domicile of the buyer, but shall be not less than four percent above the current discount rate of the Swiss Central Bank.

5.5 We shall be entitled to make deliveries of pending orders dependent upon settlement of outstanding claims.

6. Reservation of title

6.1 Delivered goods shall remain our property (reserved goods) pending full and complete payment of all present and future claims to which we are entitled regardless of their legal cause. This shall also apply if payments are made in settlement of specifically designated claims.

6.2 The buyer shall be entitled to process and sell reserved goods in the ordinary course of business.

6.3 If our reserved goods are combined or intermingled with other goods, the buyer shall hereby transfer his/its ownership rights in the new goods or chattels to us upon the conclusion of the contract in the amount of the invoice value of the reserved goods.

6.4 If the goods are resold by the buyer, he/it shall hereby transfer to us upon the conclusion of the contract with us his/its claims arising from the aforesaid resale in the amount of the invoice value of the reserved goods.

6.5 If the reserved goods are used by the buyer to perform a works or works delivery contract, his/its claim from the aforesaid works or works delivery contract shall hereby be assigned to us in the same amount and on the same date as for the purchase price claim (Section 6.4).

6.6 As long as he/it is honouring his/its payment obligations, the buyer shall, however, be authorised to collect his/its resale claim which has been assigned to us. He/it may not dispose of such claims by way of assignment to third parties, however. The empowerment of the buyer to collect the claim may be revoked by us at any time. We shall be entitled to notify third party debtors of the assignment. The buyer shall be entitled to provide us with the necessary information and documents in order to enable us to enforce our rights.

6.7 If the value of our securities exceeds our total claims by more than 10 %, we shall be obliged to release securities of our choice at the request of the buyer.

6.8 The buyer shall inform us immediately of any pledge or other impediment to our property enforced by third parties.

6.9 The buyer shall be obliged to collaborate in measures required to protect our title. He/it shall, in particular, empower us upon the conclusion of the contract to make entries or prior notice of the reservation of title at his/its cost in public registers, books and documents, etc., in accordance with the relevant national laws and shall perform all formalities in this respect.

6.10 The buyer shall maintain the reserved goods at his/its cost for the duration of the reservation of title and shall insure the said goods against theft, breakage, fire, water and other risks in our favour. He/it shall also take all steps to ensure that our property claims are neither adversely affected nor rescinded.

7. Delivery periods

7.1 Delivery periods and deadlines stated by us shall be approximate unless we have given an express written confirmation of a deadline as binding.

7.2 Delivery periods shall be deemed to have been met if notification of readiness to deliver has been sent to the buyer before the end of the delivery period.

7.3 The delivery period shall be prolonged if details required for the performance of the contract are not received on time or if they are subsequently changed by the buyer.

7.4 The delivery period shall also be reasonably prolonged if impediments arise which we cannot avert despite exercise of the necessary care (e.g. major operational disruptions, industrial disputes, delayed or defective deliveries, force majeure, etc.).

7.5 If an agreed delivery date is met by more than 14 days, the buyer shall be obliged to set us a reasonable period of grace. The buyer may only withdraw from the contract if our goods have not been delivered by the end of the said period of grace. Compensation claims for non-performance, delayed performance or any consequential losses shall be excluded unless there was gross negligence on our part.

8. Transfer of risk

8.1 Unless expressly agreed otherwise in writing, our “ex works” deliveries shall be made in accordance with the international rules on

the interpretation of commercial clauses of the International Chamber of Commerce (Incoterms) in the version in force on the date of the order confirmation.

8.2 The transfer of risk shall be determined by the aforesaid Incoterms.

8.3 Insurance against damages of any kind shall be the responsibility of the buyer.

8.4 Complaints in connection with the transport shall be immediately notified by the buyer to the last carrier upon receipt of the delivery.

8.5 If despatch is delayed at the request of the buyer or for any other reasons not attributable to us, the risk shall pass to the buyer on the original date envisaged for the "ex works" delivery. We shall be entitled to demand payment from this date onwards.

9. Delivery inspection

9.1 The buyer shall be required to inspect deliveries immediately. If the goods do not comply with the order or the delivery note or if visible defects are identified, he/it shall be obliged to notify the aforesaid to us in writing within eight days of receipt. Later complaints shall not be recognised. (Re transport damages, cf. Section 8.4)

10. Assembly and operations

10.1 The assembly, putting into operation, operation and maintenance of the delivered goods shall be carried out in accordance with our guidelines. They may be executed by our staff or by appropriately trained third parties as agreed with the buyer.

10.2 If we require a commissioning certificate for certain product groups, warranty claims for the proper functioning of the equipment can only be enforced if a proper hand-over has been documented by a confirmed commissioning certificate received by us within one month of the hand-over.

11. Warranty

11.1 Warranty period

11.1.1 The general warranty period shall be 12 months from the first commissioning but no longer than 18 months from the date on which the relevant goods left our works.
If despatch is delayed for reasons not attributable to us, the warranty shall lapse no later than 18 months after notification of the readiness to deliver.
The general warranty period shall exclude electrical components for which the warranty period shall be 6 months from the first commissioning but no later than 12 months from the date of shipment from our works.

11.1.2 We refer to Section 11.6.1 with regard to the warranty period for third party products.

11.1.3 The warranty period for components which we have repaired during the warranty period or have delivered as replacement shall be 12 months from the completion of our repair or from the date of the replacement delivery but no longer than the end of a period equivalent to twice the original warranty period as per Section 11.1.1.

11.2 Liability for material, design and workmanship defects

11.2.1 The contractual condition of the goods shall be based on the condition upon the transfer of risk.

11.2.2 Defects shall be notified to us immediately in writing.

11.2.3 We shall be liable for all components which can be shown to have become defective or unusable before the end of the warranty period as a result of defective materials, defective design or defective workmanship, with such components being repaired or replaced ex works immediately at our choice.

11.3 Liability for warranted qualities

11.3.1 Warranted qualities shall only be those which are specifically designated as such in the order confirmation or in the relevant specifications.

11.3.2 The aforesaid assurance shall apply at the latest until the end of the warranty period. If a taking-over test has been agreed with the buyer, the assurance shall be deemed as performed if proof of the relevant qualities is furnished during the aforesaid test.

11.3.3 If the warranted qualities are not performed or only partially performed, the buyer shall be entitled to an immediate rectification. The buyer shall grant us the necessary time and opportunity for this purpose.

11.3.4 If the rectification is abortive or only partially successful, the buyer shall be entitled to a reasonable reduction of the purchase price. If the defect is so serious that it cannot be rectified within a reasonable period of time, and if deliveries or services for the notified purpose are not usable or are only usable to a much lesser extent, the buyer shall be entitled to refuse acceptance of the defective component or to withdraw from the contract if part-acceptance is economically unreasonable. We shall only be obliged to refund amounts which have been paid to us for the components affected by the aforesaid withdrawal.

11.4 Exclusion of liability for defects

11.4.1 Our liability shall exclude damages which cannot be proved to have been sustained as a result of defective material, defective design or defective workmanship.

11.4.2 Damages shall therefore be excluded for example which were caused by
- improper work of other persons with regard to planning, site preparation, assembly, operation and maintenance;
- plant concepts and designs which do not comply with the latest state of the art;
- non-observance of our guidelines for planning, assembly, commissioning, operations and maintenance;
- force majeure (e.g. thunderstorms).

11.4.3 The following shall be excluded in particular
- corrosion damages (e.g. as a result of aggressive water, unsuitable water treatment, oxygen intakes, emptying the plant over a longer period of time, falling below the dew point, chemical or electrochemical effects, etc.);
- damages caused by air pollution (e.g. the accumulation of intense dust, aggressive vapours, etc.);
- damages caused by unsuitable equipment and fuels;
- damages caused by overcharging, excessive water pressure, scaling, improper electrical connections and inadequate fuse protection.

11.4.4 Components shall also be excluded from the warranty which are subject to natural wear and tear (e.g. burner nozzles, combustion chamber inserts, ignition and monitoring components in contact with fire, fireclay and wall facings, fuses, seals and flexible tubes).

11.5 Commissioning certificate

11.5.1 We hereby draw attention to the due and proper hand-over and - if envisaged - the commissioning certificate in accordance with Section 10.2 as prerequisites for our warranty.

11.6 Deliveries and services of sub-contractors

11.6.1 Our liability for third party products which form a major part of the delivered goods (e.g. warehouse and conveying equipment, burners, measuring and control equipment, electrical components, flue gas and waste water cleaning equipment) shall - if permissible - be limited to an assignment of our claims against the suppliers of the said third party products.

12. Exclusion of further liability

12.1 The buyer shall have no rights and claims for materials, design and workmanship defects or the lack of warranted qualities unless specifically mentioned in Sections 11.1 to 11.6.

12.2 All claims for compensation, reduction in the contract price, rescission of the contract or withdrawal from the contract shall be excluded in particular unless these are specifically mentioned. Under no circumstances shall the buyer have any compensation claim for damages which were not sustained by the delivered goods themselves (e.g. replacement costs, cost for establishing the cause of the damage, expertises, production stoppages, production losses, lost orders, lost profit and other direct or indirect damages). The aforesaid liability exclusion shall not apply in the event of gross negligence on our part.

12.3 The exclusion as per Section 12.2 shall apply for all breaches of contract and all claims of the buyer regardless of why they were lodged from a legal point of view. It shall therefore also apply for a breach of any ancillary obligations (e.g. inadequate advice, etc.).

13. Jurisdiction

13.1 **The place of jurisdiction for the buyer and for us shall be Vaduz.** We shall be entitled to bring action against the buyer at his/its domicile, however.

13.2 The legal relationship between the parties shall be governed by the substantive laws of Switzerland. The application of the UN convention on contracts for the international sale of goods (CISG) shall be excluded.