

Accessories Program

Edition 2019-10

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1 Hydraulic connections

Notes:

Please select diameters corresponding to the flow rate.

Following ISO 7/228, the designation G is used for connections where the pipe threads are not water-tight (with sealing lip), and the designation R for thread sealing connections (conical external thread).


The temperature data for the hydraulic connections refer to the maximum main line temperatures of the unit for simplifying an evaluation. The temperature stabilities of the components are usually higher than the values quoted.

For main line temperatures for water 180 °C and for oil 200 °C liquid sealing H1020 must be used instead of H1015.

1.1 Filter (seperatly)

brass (thread sealing; housing size 1–3)


water up to 160 °C, oil up to 200 °C

	Filter brass (filter stainless 0,5 mm)							
G ³ / ₄	O/ID	T24133						
G1 ¹ / ₄	O/ID	T24135						

Ordering example: Filter brass, G³/₄ (O/ID T24133)

stainless (thread sealing; all housing sizes)


water up to 180 °C

	Filter stainless (filter stainless 0,5 mm)							
G ³ / ₄	O/ID	T25531						
G1 ¹ / ₄	O/ID	T25745						

Ordering example: Filter stainless, G³/₄ (O/ID T25531)

GGG (for sealing lip)

oil up to 250 °C


	Filter nodular graphite iron (filter stainless 0,8 mm)							
G ³ / ₄	O/ID	T24137						

Ordering example: Filter GGG, G³/₄ (O/ID T24137)

1.2 Filter set

brass (thread sealing; housing size 1–3)


water up to 160 °C, oil up to 200 °C

		1x Filter brass (filter stainless 0,5 mm) 1x Male adapter brass (tread sealing; 24141: brass; 24142: stainless)							
R ³ / ₄	O/ID	T24141							
R1 ¹ / ₄	O/ID	T24142							

Ordering example: Filter set brass, R³/₄ (O/ID T24141)

stainless (thread sealing; all housing sizes)

water up to 180 °C


		1x Filter stainless (filter stainless 0,5 mm) 1x Male adapter (thread sealing; 25661: brass; 25750: stainless)							
R ³ / ₄	O/ID	T25661							
R1 ¹ / ₄	O/ID	T25750							

Ordering example: Filter set stainless, R³/₄ (O/ID T25661)

1.3 Filter set (adjustable)

brass (thread sealing; housing size 1–3)


water up to 160 °C, oil up to 200 °C

		1x Filter brass (filter stainless 0,5 mm) 1x Adjustable screw joint brass (thread sealing)							
R ³ / ₄	O/ID	T24720							

Ordering example: Filter set (adjustable) brass, R³/₄ (O/ID T24720)

stainless (thread sealing; all housing sizes)


water up to 180 °C

		1x Filter stainless (filter stainless 0,5 mm) 1x Adjustable screw joint brass (thread sealing)							
R ³ / ₄	O/ID	T25774							

Ordering example: Filter set (adjustable) stainless, R³/₄ (O/ID T25774)

GGG (with sealing lip)

oil up to 250 °C


		1x Filter nodular graphite iron (filter stainless 0,8 mm) 1x Adjustable screw joint stainless (with sealing lip)							
G ³ / ₄	O/ID	T24143							

Ordering example: Filter set (adjustable) GGG, G³/₄ (O/ID T24143)

1.4 Connection set main/return line

stainless (thread sealing)


water up to 180 °C, oil up to 200 °C

		2x Male adapter stainless (screw-in side thread sealing; hose side 24° conical nipple with metric thread)						
		M14x1,5	M16x1,5	M18x1,5	M22x1,5	M26x1,5	M30x2	M36x2
R$\frac{1}{2}$	O/ID	T28194-1	T28194-2					
R$\frac{3}{4}$	O/ID	T24146-1	T24146-2	T24146-3	T24146-4	T24146-5	T24146-6	
R1 $\frac{1}{4}$	O/ID							T24147-7 T24147-8

Ordering example: Connection set main/return line stainless, R $\frac{3}{4}$ - M22x1,5 (O/ID T24146-4)

stainless (with sealing lip)

water up to 230 °C, oil up to 250 °C


		2x Male adapter stainless (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
		M14x1,5	M16x1,5	M18x1,5	M22x1,5	M26x1,5	M30x2	
G$\frac{3}{4}$	O/ID	T22275-1	T22275-2	T22275-3	T22275-4	T22275-5	T22275-6	

Ordering example: Connection set main/return line stainless, G $\frac{3}{4}$ - M22x1,5 (O/ID T22275-4)

1.5 Connection set mould

stainless (with sealing lip)

water up to 230 °C

		2x Male adapter stainless (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
		M18x1,5	M22x1,5					
G$\frac{3}{8}$	O/ID	T28150-3	T28150-4					
G$\frac{1}{2}$	O/ID		T28151-4					

Ordering example: Connection set mould stainless, G $\frac{1}{2}$ - M22x1,5 (O/ID T28151-4)

1.6 Hose

PTFE (non-insulated)


water up to 180 °C, oil up to 200 °C

		Hose PTFE (smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)						
		DN10		DN13		DN16	DN25	
		M14x1,5	M18x1,5	M16x1,5	M22x1,5	M26x1,5	M36x2	
Length mm	500	O/ID	T21783-3					
	750	O/ID	T21783-4		T21786-4			
	800	O/ID		T21785-28				
	1000	O/ID	T21783-5		T21786-5			
	1200	O/ID				T21788-32		
	1500	O/ID	T21783-6	T21784-6	T21785-6	T21786-6	T21788-6	
	1600	O/ID					T21788-35	
	1800	O/ID			T21785-37			
	2000	O/ID	T21783-7	T21784-7	T21785-7	T21786-7	T21788-7	
	2500	O/ID	T21783-8	T21784-8	T21785-8	T21786-8	T21788-8	
	3000	O/ID	T21783-9	T21784-9	T21785-9	T21786-9	T21788-9	T26297-9
	3500	O/ID			T21785-12			
	4000	O/ID			T21785-10	T21786-10	T21788-10	T26297-10
	5000	O/ID			T21785-13		T21788-11	T26297-11
6000	O/ID			T21785-14				
Bend radius mm		>100	>100	>135	>135	>160	>250	

Ordering example: Hose PTFE, M22x1,5; DN13x3000 (O/ID 21786-9)

PTFE insulated


water up to 180 °C, oil up to 200 °C

		Hose PTFE insulated (smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)					
		DN10		DN13		DN16	DN25
		M14x1,5	M18x1,5	M16x1,5	M22x1,5	M26x1,5	M36x2
Length mm	1000	O/ID			T21785-501		
	1500	O/ID				T21786-601	
	2000	O/ID	T21783-701		T21785-701	T21786-701	
	2500	O/ID			T21785-801		
	3000	O/ID			T21785-901	T21786-901	T21788-901
	3500	O/ID			T21785-121		
	4000	O/ID			T21785-101		
	4500	O/ID			T21785-151		
	5000	O/ID	T21783-111				
Bend radius mm		>100	>100	>135	>135	>160	>250

Ordering example: Hose PTFE insulated, M22x1,5; DN13x3000 (O/ID 21786-901)

PFA (non-insulated)


water up to 180 °C, oil up to 200 °C

		Hose PFA (highly flexible corrugated hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)								
		DN8		DN10			DN13		DN16	DN25
		M14x1,5		M14x1,5	G^{3/8}	M16x1,5	G^{3/8}	M26x1,5	M36x2	
Length mm	250	O/ID	T21791-1	T21792-1	T22609-1	T21793-1	T22610-1			
	350	O/ID	T21791-2	T21792-2	T22609-2	T21793-2	T22610-2	T21794-2		
	500	O/ID	T21791-3	T21792-3	T22609-3	T21793-3	T22610-3	T21794-3		
	750	O/ID	T21791-4	T21792-4	T22609-4	T21793-4	T22610-4	T21794-4		
	1000	O/ID	T21791-5	T21792-5	T22609-5	T21793-5	T22610-5	T21794-5	T26296-11	
	1200	O/ID		T21792-32						
	1500	O/ID				T21793-6	T22610-6			
	2000	O/ID	T21791-7	T21792-7		T21793-7		T21794-6	T26296-8	
	2500	O/ID		T21792-8		T21793-8	T22610-8			
	3000	O/ID		T21792-9		T21793-9				
	3500	O/ID				T21793-12				
4000	O/ID		T21792-10		T21793-10			T26296-10		
5000	O/ID		T21792-11		T21793-11					
Bend radius mm			>40	>50	>50	>60	>60	>60	>80	

Ordering example: Hose PFA, M16x1,5; DN13x1000 (O/ID 21793-5)

PFA insulated


water up to 180 °C, oil up to 200 °C

		Hose PFA insulated (highly flexible corrugated hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)								
		DN8		DN10			DN13		DN16	DN25
		M14x1,5		M14x1,5	G^{3/8}	M16x1,5	G^{3/8}	M26x1,5	M36x2	
Length mm	1000	O/ID				T21793-501			T26296-111	
	2000	O/ID							T26296-811	
	3500	O/ID							T26296-911	
Bend radius mm			>40	>50	>50	>60	>60	>60	>80	

Ordering example: Hose PFA insulated, M16x1,5; DN13x1000 (O/ID 21793-501)

stainless (non-insulated)


water up to 180 °C, oil up to 250 °C

	Hose stainless (highly flexible corrugated metal hose with metal cladding; welded universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)						
			DN12	DN16	DN20		
			M22x1,5	M26x1,5	M30x2		
Length mm	750	O/ID	T21797-4				
	1000	O/ID	T21797-5	T21798-5			
	1500	O/ID	T21797-6	T21798-6	T21799-6		
	2000	O/ID	T21797-7	T21798-7	T21799-7		
	2500	O/ID	T21797-8	T21798-8	T21799-8		
	3000	O/ID	T21797-9	T21798-9	T21799-9		
	4000	O/ID	T21797-10	T21798-10	T21799-10		
	5000	O/ID	T21797-11	T21798-12			
Bend radius mm			>100	>110	>130		

Ordering example: Hose stainless, M26x1,5; DN16x3000 (O/ID 21798-9)

stainless insulated


water up to 180 °C, oil up to 250 °C

	Hose stainless insulated (highly flexible corrugated metal hose with metal cladding; welded universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)						
			DN12	DN16	DN20		
			M22x1,5	M26x1,5	M30x2		
Length mm	750	O/ID	T21797-411				
	2000	O/ID	T21797-711				
	2500	O/ID		T21798-81	T21799-81		
	3000	O/ID		T21798-91			
	5000	O/ID	T21797-111				
	6000	O/ID		T21798-111			
Bend radius mm			>100	>110	>130		

Ordering example: Hose stainless insulated, M26x1,5; DN16x3000 (O/ID 21798-91)

stainless insulated


water up to 230 °C

	Hose stainless insulated (flexible corrugated metal hose – hydraulically formed – with abrasion protection and metal cladding; welded universal conical seal and nut stainless; nut and press mounting cadmium plated steel; max. operating pressure 47 bar)						
	Note: → The metal corrugated hose is a wear part at high temperatures. → Weak point is the longitudinal weld seam. When bending, it should be inside of radius. → For longer life time only use hydraulically formed corrugated hoses (no mechanically formed!)						
			DN10	DN12			
		M18x1,5	M22x1,5				
Length mm	750	O/ID		T27895-4			
	2000	O/ID	T28013-7				
	4000	O/ID		T27895-10			
Bend radius mm			>150	>165			

Ordering example: Hose stainless insulated, M22x1,5; DN12x4000 (O/ID T27895-10)

NBR (cooling-, separate system water hose)

water up to 100 °C


	High flexible universal pressure hose; max. operating pressure 10 bar								
			DN9	DN13	DN19				
Length X in m	O/ID	T22273-1	T22273-2	T22273-4					
Bend radius mm		>30	>50	>90					

Ordering example: Hose NBR DN13, Length X m (O/ID 22273-2)

1.7 Connection set cooling-, separate system water

quick-release shut-off coupling, brass


water up to 100 °C

	2x Nipples brass (thread sealing) 2x Quick-release shut-off coupling with valve and hose nozzles brass / Viton® ¹⁾ 4x Hose clips 2x Cable straps (colour coding for cooling water)								
	¹⁾ trademark of DuPont Dow Elastomers								
		DN9	DN13	DN19					
R ¹ / ₄	O/ID	T24221							
R ³ / ₈	O/ID	T22402	T22049						
R ¹ / ₂	O/ID			T24215					
R ³ / ₄	O/ID			T24222					

Ordering example: Connection set cooling-, separate system water, quick-release shut of coupling, brass
R³/₈ - DN13 (O/ID T22049)

sealing cone, brass

water up to 100 °C


	2x Male adapter brass (male side thread sealing; female side with 60° sealing cone and inch thread) 2x Hose nozzles brass with swivel nuts steel zinc-plated (inch thread, universal sealing cone) 4x Hose clips 2x Cable straps (colour coding for cooling water)								
			DN9	DN13	DN19				
R ¹ / ₄	O/ID	T23980							
R ³ / ₈	O/ID	T22034	T23973						
R ¹ / ₂	O/ID		T22050						
R ³ / ₄	O/ID			T24216					

Ordering example: Connection set cooling-, separate system water, sealing cone, brass
R³/₈ - DN13 (O/ID T23973)

1.8 Reducing nipple

stainless (with sealing lip)

water up to 230 °C, oil up to 200 °C


		Reducing nipple stainless (external thread cylindrical with sealing lip)							
G $\frac{1}{2}$ - $\frac{1}{4}$	O/ID	T21818-1							
G $\frac{1}{2}$ - $\frac{3}{8}$	O/ID	T21818-2							
G $\frac{3}{4}$ - $\frac{1}{4}$	O/ID	T21818-3							
G $\frac{3}{4}$ - $\frac{3}{8}$	O/ID	T21818-4							
G 1- $\frac{3}{4}$	O/ID	T21818-5							

Ordering example: Reducing nipple stainless $G\frac{3}{4} - \frac{3}{8}$ (O/ID T21818-4)

1.9 Male adapter

brass (thread sealing)


water up to 180 °C, oil up to 200 °C

		Male adapter brass (thread sealing)							
R $\frac{3}{4}$	O/ID	T21763							

Ordering example: Male adapter brass, $R\frac{3}{4}$ (O/ID T21763)

stainless (thread sealing)

water up to 180 °C, oil up to 200 °C


		Male adapter stainless (thread sealing)							
R 1 $\frac{1}{4}$	O/ID	T25748							

Ordering example: Male adapter stainless, $R1 \frac{1}{4}$ (O/ID T25748)

1.10 Adjustable screw joint

brass (thread sealing)


water up to 180 °C, oil up to 200 °C

		Adjustable screw joint brass (thread sealing)							
R $\frac{1}{2}$	O/ID	T23087							
R $\frac{3}{4}$	O/ID	T21163							

Ordering example: Adjustable screw joint brass, $R\frac{3}{4}$ (O/ID T21163)

stainless (with sealing lip)

oil up to 250 °C


		Adjustable screw joint stainless (with sealing lip)						
G $\frac{3}{4}$	O/ID	T24161						

Ordering example: Adjustable screw joint stainless, G $\frac{3}{4}$ (O/ID T24161)

1.11 Adapter for central coupling main/return line

brass (Thermo-5, housing size 1 and 2; Treat-5)


water up to 160 °C, oil up to 200 °C

		2x O-ring FPM 1x Cylinder head screw stainless M8x40 1x Spring washer 1x Locking ring						
Thermo-5, Treat-5	O/ID	T25651						

Ordering example: Adapter for central coupling main/return line brass, water up to 160 °C (O/ID T25651)

brass (Thermo-5, housing size 2)

water up to 180 °C


		2x O-ring FFKM 1x Cylinder head screw stainless M8x40 1x Spring washer 1x Locking ring						
Thermo-5	O/ID	T25651-1						

Ordering example: Adapter for central coupling main/return line brass, water up to 180 °C (O/ID T25651-1)

1.12 Adapter for central coupling cooling water

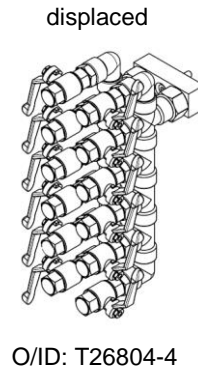
brass (Thermo-5, housing size 1 und 2)

water up to 100 °C

		2x O-ring FPM 1x Cylinder head screw stainless M8x40 1x Spring washer 1x Locking ring						
Thermo-5	O/ID	T28008						

Ordering example: Adapter for central coupling cooling water brass (O/ID T28008)

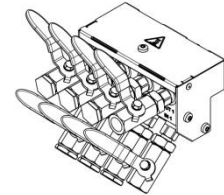
1.13 Manifold with/without shut-off valves (Thermo-5)



with main line filter



Model: Attachment



Heat transfer medium	Max. main line temperature	Housing size	Type of manifold	Note	O/ID
Water	160 °C	1 und 2	2x2xG $\frac{1}{2}$ with shut-off valves		T24963-5
			2x2xG $\frac{1}{2}$ with shut-off valves	with main line filter	T26368-3
			2x2xG $\frac{3}{4}$ without shut-off valves	with main line filter	T26368-1
			2x3xG $\frac{1}{2}$ with shut-off valves		T26068
			2x4xG $\frac{1}{2}$ with shut-off valves		T24963
			2x4xG $\frac{1}{2}$ with shut-off valves	with main line filter	T26368-4
			2x4xG $\frac{1}{2}$ without shut-off valves		T24963-1
			2x4xG $\frac{3}{4}$ without shut-off valves	with main line filter	T26368-2
			2x5xG $\frac{1}{2}$ with shut-off valves	displaced	T26804-2
	2x6xG $\frac{1}{2}$ with shut-off valves	displaced	T26804-1		
	180 °C	2	2x2xG $\frac{1}{2}$ with shut-off valves	Model: Attachment	T27999-1
			2x3xG $\frac{1}{2}$ with shut-off valves	Model: Attachment	T27999-2
			2x4xG $\frac{1}{2}$ with shut-off valves	Model: Attachment	T27999-3
			2x4xG $\frac{1}{2}$ without shut-off valves	Model: Attachment	T27610
			2x4xG $\frac{1}{2}$ with shut-off valves		T24963-6
			2x4xG $\frac{1}{2}$ without shut-off valves		T24963-2
			2x5xG $\frac{1}{2}$ with shut-off valves	displaced	T26804-3
			2x6xG $\frac{1}{2}$ with shut-off valves		T24963-8
			2x6xG $\frac{1}{2}$ without shut-off valves		T24963-3
2x6xG $\frac{3}{8}$ with shut-off valves				T24963-4	
2x6xG $\frac{3}{8}$ with shut-off valves	displaced	T26804-4			
230 °C	2B	2x4xG $\frac{1}{2}$ without shut-off valves		T28014	
Oil	200 °C	2	2x2xG $\frac{1}{2}$ with shut-off valves		T24963-9
			2x4xG $\frac{1}{2}$ with shut-off valves		T24963-7
	250 °C	3	2x2xG $\frac{3}{4}$ without shut-off valves		T27858

Ordering example:

Manifold 2x4xG $\frac{1}{2}$ with shut-off valves (attachment), Wasser up to 180 °C (O/ID T27999-3)

1.14 Connection set Vario-5/Thermo-5 (housing size 1 or 2)



(non-insulated)

water up to 180 °C

		2x Hose PTFE M22x1,5, DN13 (smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar) 4x Male adapter stainless G $\frac{3}{4}$ -M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)								
Length mm	3000	O/ID	T26847-9							
Bend radius mm			>135							

Ordering example: Connection set Vario-5/Thermo-5, Length 3000 mm (O/ID T26847-9)

insulated

water up to 180 °C


		2x Hose PTFE insulated M22x1,5, DN13 (smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar) 4x Male adapter stainless G $\frac{3}{4}$ -M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)								
Length mm	3000	O/ID	T26847-901							
Bend radius mm			>135							

Ordering example: Connection set Vario-5/Thermo-5 insulated, Length 3000 mm (O/ID T26847-901)

1.15 Connection set Vario-5/Thermo-5 (housing size 3)

(non-insulated)


water up to 180 °C

	2x	Hose PTFE M22x1,5, DN13 (Smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)						
	2x	Male adapter stainless R1 1/4 -M22x1,5 (screw-in side thread sealing; hose side 24° conical nipple with metric thread)						
	2x	Male adapter stainless G3/4-M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
Length mm	3000 O/ID	T26848-9						
Bend radius mm		>135						

Ordering example: Connection set Vario-5/Thermo-5, Length 3000 mm (O/ID T26848-9)

insulated

water up to 180 °C


	2x	Hose PTFE insulated M22x1,5, DN13 (Smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)						
	2x	Male adapter stainless R1 1/4 -M22x1,5 (screw-in side thread sealing; hose side 24° conical nipple with metric thread)						
	2x	Male adapter stainless G3/4-M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
Length mm	2000 O/ID	T26848-801						
	3000 O/ID	T26848-901						
Bend radius mm		>135						

Ordering example: Connection set Vario-5/Thermo-5 insulated, Length 3000 mm (O/ID T26848-901)

1.16 Connection set Vario-5/Mould

(non-insulated)


water up to 180 °C

	2x	Hose PTFE insulated M22x1,5, DN13 (smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)						
	2x	Male adapter stainless G3/4-M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
	2x	Male adapter stainless G1/2-M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
Length mm	1500 O/ID	T26841-6						
	2000 O/ID	T26841-7						
Bend radius mm		>135						

Ordering example: Connection set Vario-5/Mould, Length 2000 mm (O/ID T26841-7)

insulated

water up to 180 °C

	2x	Hose PTFE M22x1,5, DN13 (smooth hose with metal cladding and universal conical seal stainless; nut and press mounting cadmium plated steel; max. operating pressure 25 bar)						
	2x	Male adapter stainless G3/4-M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
	2x	Male adapter stainless G1/2-M22x1,5 (screw-in side with sealing lip; hose side 24° conical nipple with metric thread)						
Length mm	1500 O/ID	T26841-601						
	2000 O/ID	T26841-701						
Bend radius mm		>135						

Ordering example: Connection set Vario-5/Mould insulated, Length 2000 mm (O/ID T26841-701)

1.17 Connection set Treat-5/2xThermo-5 (housing size 1 or 2)



water up to 100 °C

- 1x Adapter for central coupling brass (O/ID T25651)
- 2x Male adapter brass G $\frac{1}{2}$ -R $\frac{3}{4}$ (thread sealing)
- 2x Male adapter brass G $\frac{1}{2}$ -R $\frac{1}{4}$ (thread sealing)
- 4x Hose nozzle brass DN13
- 2x Hose NBR DN13, Length 0,8 m
- 2x Hose NBR DN13, Length 0,6 m
- 8x Hose clips
- 2x Manifold set with quick-release shut-off couplings, DN13

Treat-5, Thermo-5	O/ID	T27015-2					
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1.18 Connection set Treat-5/2xThermo-5 (housing size 3)

water up to 100 °C

- 1x Adapter for central coupling brass (O/ID T25651)
- 2x Male adapter brass G $\frac{3}{4}$ -R $\frac{3}{4}$ (thread sealing)
- 2x Male adapter brass G $\frac{3}{4}$ -R $\frac{1}{2}$ (thread sealing)
- 4x Hose nozzle brass DN19
- 2x Hose NBR DN19, Length 0,9 m
- 2x Hose NBR DN19, Length 0,9 m
- 8x Hose clips
- 2x Manifold set with quick-release shut-off couplings, DN19

Treat-5, Thermo-5	O/ID	T28045-2					
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Ordering example: Connection set Treat-5/2xThermo-5, housing size 3 (O/ID T28045-2)

2 Electrical connections

2.1 Cable interface DIGITAL (ZD)

Connection (1): Machine

Connection (2): Singular unit Thermo-5 / Control module Panel-5

Machine Manufacturer	Control system	Machine Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID			
Arburg	Selogica, Selogica direct	Sub-D 9-p.	Interface DIGITAL (ZD) (Sub-D 25-p.)	Cable R1/20 mA	1 m	T20537-1			
					2 m	T20537-3			
					3 m	T20537-4			
					4 m	T20537-5			
					5 m	T20537			
					6 m	T20537-9			
					7 m	T20537-2			
					7,5 m	T20537-7			
					8 m	T20537-10			
					10 m	T20537-6			
					15 m	T20537-11			
					20 m	T20537-8			
Dr. Boy	B&R (CT)	Sub-D 9-p.		Cable R1/RS-232	5 m	T21998			
	Procan Alpha 4, Resotec (M)	Sub-D 9-p.		Cable R1/RS-232	5 m	T19903			
Engel	Divers	Sub-D 25-p.+ Harting		Cable R1/20 mA	2 m	T18703-8			
					3 m	T18703-6			
					5 m	T18703			
					6 m	T18703-2			
					7 m	T18703-4			
					8 m	T18703-7			
					10 m	T18703-1			
					15 m	T18703-5			
					20 m	T18703-3			
					Sub-D 9-p.+ Harting		Cable R1/RS-485	3 m	T22139-2
								4 m	T22139-6
								5 m	T22139-1
	10 m	T22139-3							
	15 m	T22139-4							
	20 m	T22139-5							
	Sub-D 25-p.		Cable R1/RS-232	5 m	T16021				
				10 m	T16021-1				
	Flomo	Sub-D 9-p.		Cable R1/RS-485	3 m	T27302-2			
5 m					T27302-1				
8 m					T27302-3				
Fanuc (SPI)	S 2000 iB	without plug		Cable R1/RS-485	5 m	T24398-1			
					7 m	T24398-3			
					10 m	T24398-2			
Ferromatik Milacron	Divers	Sub-D 25p.+ Harting		Cable R1/20 mA	5 m	T20434-1			
					Cable R1/RS-485	5 m	T22117-1		
Haitian	Divers	Sub-D 9-p.		Cable R1/RS-485	5 m	T27984-1			

Machine Manufacturer	Control system	Machine Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID
KraussMaffei	MC4/5/6	Sub-D 25-p.+ Harting	Schnittstelle DIGITAL (ZD) (Sub-D 25-p.)	Cable R1/20 mA	2 m	T18703-8
					3 m	T18703-6
					5 m	T18703
					6 m	T18703-2
					7 m	T18703-4
					8 m	T18703-7
					10 m	T18703-1
					15 m	T18703-5
					20 m	T18703-3
Negri Bossi	Diverse	Sub-D 9-p.		Cable R1/RS-485	5 m	T22253-1
Sumitomo (SHI) Demag	Ergotech ZE 556	Sub-D 25-p.+ Harting		Cable R1/20 mA	2 m	T17042-5
					5 m	T17042
					7,5 m	T17042-3
					8 m	T17042-1
					10 m	T17042-4
					12 m	T17042-2
Wittmann Battenfeld	Unilog	Sub-D 9-p.		Cable R1/20 mA	5 m	T22428-1
					10 m	T22428-2
Zhafir	Divers	Sub-D 9-p.		Cable R1/RS-485	5 m	T27984-1

Ordering example: Cable R1/RS-485 (Zhafir);5 m (O/ID T27984-1)

Connection (1): Singular unit Thermo-5 / Control module Panel-5

Connection (2): Singular unit Thermo-5 / Control module Panel-5

Interface	HB-Therm Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID
ZD	Interface DIGITAL (ZD) (Sub-D 25-p.)	Interface DIGITAL (ZD) (Sub-D 25-p.)	Cable R1-R2/RS-422	0,5 m	T15742-12
				0,6 m	T15742-9
				1 m	T15742
				1,5 m	T15742-1
				2 m	T15742-2
				2,5 m	T15742-6
				3 m	T15742-3
				3,5 m	T15742-13
				4 m	T15742-15
				5 m	T15742-4
				6 m	T15742-11
				7 m	T15742-10
				8 m	T15742-7
				10 m	T15742-5
				11,5 m	T15742-16
				13 m	T15742-17
15 m	T15742-8				
18 m	T15742-1				
20 m	T15742-14				

Ordering example: Cable R1-R2/RS-422; 0,6 m (O/ID T15742-9)

2.2 Cable interface CAN (ZC)

Connection (1): Machine

Connection (2): Singular unit Thermo-5 / Control module Panel-5

Machine Manufacturer	Control system	Machine Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID
Arburg	Divers (EM66)	Sub-D 9-p.	Interface CAN (ZC)	Cable CAN	0,6 m	T22571-5
					1 m	T22571-8
					1,8 m	T22571-2
					3 m	T22571-7
					5 m	T22571-1
					6 m	T22571-4
					7 m	T22571-6
					10 m	T22571-3
					20 m	T22571-10
					35 m	T22571-9
Netstal	DSP (EM 66)	Sub-D 9-p.		Cable CAN	0,6 m	T22571-5
					1 m	T22571-8
					1,8 m	T22571-2
					3 m	T22571-7
					5 m	T22571-1
					6 m	T22571-4
					7 m	T22571-6
					10 m	T22571-3
					20 m	T22571-10
					35 m	T22571-9
Sumitomo (SHI) Demag	Ergotech ZE 552	²⁾		Cable adapter CAN	-	T22590
Wittmann Battenfeld	Divers	Sub-D 9-p.		Cable CAN	0,6 m	T22571-5
					1 m	T22571-8
					1,8 m	T22571-2
					3 m	T22571-7
					5 m	T22571-1
					6 m	T22571-4
					7 m	T22571-6
					10 m	T22571-3
					20 m	T22571-10
					35 m	T22571-9

Ordering example: Cable CAN (Netstal); 0,6 m (O/ID T22571-5)

Note: ²⁾ at Sumitomo (SHI) Demag, the CAN-Bus cable is already present on the machine. However, for the connection the adapter O/ID T22590 is required.

Connection (1): Singular unit Thermo-5 / Control module Panel-5

Connection (2): Singular unit Thermo-5 / Control module Panel-5

Interface	HB-Therm Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID
ZC	Interface CAN (Sub-D 9-p.)	Interface CAN (Sub-D 9-p.)	Cable CAN	0,6 m	T22571-5
				1 m	T22571-8
				1,8 m	T22571-2
				3 m	T22571-7
				5 m	T22571-1
				6 m	T22571-4
				7 m	T22571-6
				10 m	T22571-3
				20 m	T22571-10
35 m	T22571-9				

2.3 Cable interface HB (internal interface)

Connection (1): Singular unit or modular unit Thermo-5 / Control module Panel-5 / Switching unit Vario-5

Connection (2): Modular unit Thermo-5 / Switching unit Vario-5

Interface	HB-Therm Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID
HB	Interface HB (Sub-D 15-p.)	Interface HB (Sub-D 15-p.)	Cable HB	0,6 m	T24858-2
				1 m	T24858-1
				1,5 m	T24858-4
				2 m	T24858-5
				3 m	T24858-13
				5 m	T24858-3
				6 m	T24858-11
				7 m	T24858-7
				8 m	T24858-14
				10 m	T24858-9
				15 m	T24858-6
				20 m	T24858-8
				25 m	T24858-10
30 m	T24858-12				

Ordering example: Cable HB; 0,6 m (O/ID T24858-2)

Connection (1): Singular unit or modular unit Thermo-5 / Control module Panel-5 / Flow meter Flow-5

Connection (2): Flow meter Flow-5

Interface	HB-Therm Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID
HB	Interface HB (Sub-D 15-p.)	Interface HB (Sub-D 15-p.)	Cable HB	0,6 m	T25066-2
				1 m	T25066-1
				1,5 m	T25066-11
				2 m	T25066-10
				3 m	T25066-13
				4 m	T25066-5
				5 m	T25066-3
				6 m	T25066-7
				7 m	T25066-9
				7,5 m	T25066-8
				8 m	T25066-12
				10 m	T25066-4
				11 m	T25066-15
15 m	T25066-6				
20 m	T25066-14				

Ordering example: Cable HB, 2 m (O/ID T25066-10)

Notes: Flow meter Flow-5, autonom: Interface cable is not included.
Flow meter Flow-5, unit attached: Interface cable is included.

2.4 Cable interface HB/CAN (internal interface)

Connection (1): Singular unit or modular unit Thermo-5 / Control module Panel-5 / Switching unit Vario-5


Connection (2): Singular unit Thermo-5 (in operation as a modular unit)

Interface	HB-Therm Connection (1)	HB-Therm Connection (2)	Cable description	Length	O/ID
HB	Interface HB (Sub-D 15-p.)	Interface CAN (Sub-D 9-p.)	Cable HB/CAN	0,6 m	T26825-2
				5 m	T26825-1
				10 m	T26825-4
				15 m	T26825-3
				20 m	T26825-5

2.5 Various cables




Interface	HB-Therm Connection	Machine Connection	Cable description	Length	O/ID
ZA (Thermo-5)	Connection for alarm (Han 7D; 7-p.+ E)	Without connector	Cable alarm contact	6 m	T24561-1
ZA (Flow-5)	Connection for alarm (Han 3A; 3-p. +E)		Cable alarm contact	5 m	T23377
ZB	Connection for alarm and external control (Han 7D; 7-p.+ E)		Cable alarm contact and ext. control	6 m	T24562-1
				10 m	T24562-2
		15 m		T24562-3	
ZO	RJ-45	M12	Cable R-J45/M12 d-coded	5 m	T28368-1

2.6 Heat sensor




Heat sensor Pt 100, D=6 mm, 6 m (4 wire, without connector)			O/ID	T22060-1
				
Adapter brass nickel-plated 12x25, G¼			O/ID	T22061
Adapter brass nickel-plated 12x25, M12x1			O/ID	T22062

2.7 Mains connector

	Mains connector Type J 230 V, 10 A; LNPE (Swiss Type 12)	O/ID	T27551
	Mains connector Type F 230 V, 16 A; LNPE (Schuko)	O/ID	T27550
	Mains connector CEKON 230 V, 16 A; 3LPE	O/ID	T27211
	Mains connector CEKON 230 V, 16 A; 3LNPE	O/ID	T27210
	Mains connector CEKON 230 V, 32 A; 3LNPE	O/ID	T27252
	Mains connector CEKON 230 V, 32 A; 3LPE	O/ID	T21624
	Mains connector CEKON 400 V, 16 A; 3LPE	O/ID	T16622
	Mains connector CEKON 400 V, 16 A; 3LNPE	O/ID	T16429
	Mains connector CEKON 400 V, 32 A; 3LPE	O/ID	T16623

	Mains connector CEKON 400 V, 32 A; 3LNPE	O/ID	T16621
	Mains connector CEKON 400 V, 63 A; 3LNPE	O/ID	T23389
	Mains connector CEKON 500 V, 16 A; 3LPE	O/ID	T17796
	Mains connector J15 500 V, 15 A; 3LNPE	O/ID	T23396

2.8 Connector (other)

	Alarm and external control (ZA, ZB) Connector female, Han 7D (7-p.+E) ³⁾	O/ID	T24623
	Interface DIGITAL (ZD) Connector male, Sub-D 25-p.	O/ID	T16048
	External sensor (ZE) Connector male 90°, PREH 5-p.	O/ID	T16042



Note: ³⁾ Crimping tool required for plug assembly

3 Miscellaneous accessories

3.1 Switching unit Vario-5




Cable ext. control	3 m	O/ID	T26928-2
Cable ext. control ⁴⁾	10 m	O/ID	T26928-1
Proximity switch with magnetic base 	10 m	O/ID	T26821-10
IR temperature sensor with magnetic base 	3 m	O/ID	T26819-1
IR temperature sensor with magnetic base 	10 m	O/ID	T26819-10
Emission level stickers 25 mm (7 pieces) 		O/ID	T26843-1

Note: ⁴⁾ included in standard equipment Vario-5

<p>Mains connector Type J (Swiss Type 12) 230 V, 10 A; LNPE</p> 		O/ID	T27551
<p>Mains connector Type F (Schuko) 230 V, 16 A; LNPE</p> 		O/ID	T27550




3.2 Flow meter Flow-5

Model: Unit attachment

Additional equipment	Type	HB-FM160	HB-FM180	HB-FM200
<p>Shut-off valves</p> 	O/ID	ZH	ZH	ZH
<p>Shut-off valve brass G$\frac{1}{2}$ (thread sealing; water up to 160 °C)</p> 	O/ID	T25918		
<p>Shut-off valve stainless G$\frac{1}{2}$ (with sealing lip; water up to 180 °C, oil up to 200 °C)</p> 	O/ID		T26006	T26006
<p>Cable HB, 1 m ⁵⁾</p>	O/ID	T25066-1	T25066-1	T25066-1

Note: ⁵⁾ On flow meter Flow-5 (model: unit attachment), cable HB (O/ID T25066-1) for data interface is included. Other lengths see electrical connections (page 16)

Model: Autonomic assembly

Additional equipment	Type	HB-FM160	HB-FM180
Shut-off valves G½ (for all circuits)  <i>Symbolic: HB-FM160</i>	O/ID	ZH	ZH
Shut-off valve brass G½ (thread sealing; water up to 160 °C) 	O/ID	T25918	
Shut-off valve stainless G½ (with sealing lip; water up to 180 °C) 	O/ID		T26006
Parallel connection set G¾ 	O/ID	T26243-1	T26243-4
Parallel connection set with shut-off valves G¾ 	O/ID	T26243-2	T26243-3
Adjustable screw joint set (per circuit; with sealing lip) G½ 	O/ID	T26173	T26173
Cable HB, 5 m ⁶⁾	O/ID	T25066-3	T25066-3
Cable ZA, 5 m	O/ID	T23377	T23377

Note: ⁶⁾ On flow meter Flow-5 (model: autonomic assembly), cable HB for data interface is not included. Other lengths see electrical connections (page 16)

3.3 Water treatment unit Treat-5

Test kit Treat-5 for ST-DOS H-390	O/ID	T27133
Test kit Treat-5 for ST-DOS H-314	O/ID	T25984
Test kit Treat-5 for pH-Wert	O/ID	T26582
Conditioning agent ST-DOS H-390.; 5 kg (approx. 250 L system water)	O/ID	T25907
Conditioning agent ST-DOS H-314; 5 kg (approx. 250 L system water)	O/ID	T25983



Note: Recommendation for pH tester: www.carlroth.com
 Recommended water treatment agents (D8087-EN): www.hb-therm.ch/downloads

3.4 Cleaning unit Clean-5

Test kit Clean-5 for pH-Wert	O/ID	T26583
Cleaning agent BEIZER 640; 5 kg (ca. 100 L)	O/ID	T26569
Neutralising agent ST-DOS N-720; 5 kg (ca. 100 L)	O/ID	T26570
Conditioning and preserving agent ST-DOS H-314; 5 kg (ca. 250 L)	O/ID	T25983

Note: Recommendation for pH tester: www.carlroth.com
 Recommended agents for cleaning unit Clean-5 (D8111-EN): www.hb-therm.ch/downloads

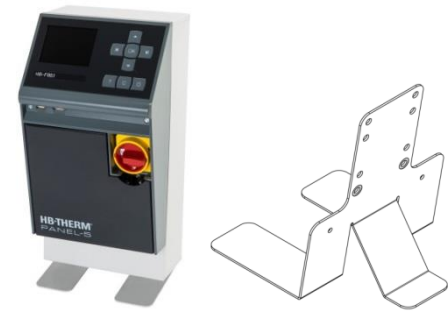
3.5 Control module Panel-5

Additional equipment	Type	HB-FB51
Keyboard-protection 	O/ID	ZK
Mains connector Type J (Swiss Type 12) 230 V, 10 A; LNPE 	O/ID	T27551
Mains connector Type F (Schuko) 230 V, 16 A; LNPE 	O/ID	T27550
Pivoting base for control module 	O/ID	T25620

Mount for control module Panel-5

O/ID

T27726-1



Ordering example: *Mount for control module Panel-5 (O/ID T27726-1)*

Note: *The Control Module Panel-5 does not include any cables for the data interfaces. (Cable electrical connections → page 15)*

3.6 Checking facility for temperature control units



Checking facility	Type	HB-TP180-12	HB-TP200-12	HB-TP180-45
		Heat transfer medium	Water	Oil
max. Temperature	°C	180	200	180
for connection main/return line		G $\frac{3}{4}$	G $\frac{3}{4}$	G1 $\frac{1}{4}$

Ordering example: *Checking facility HB-TP180-12, water, English*


Post-calibration of checking facility with certificate

O/ID

T24047

Note: *Recommendation for Pt 100 reference measuring: www.gmc-instruments.de*

3.7 Shipping crate

	Shipping crate 1-2, Series 5 (housing size 1, max. 2 units)	O/ID	T27665-2
	Shipping crate 1-3, Series 5 (housing size 1, max. 3 units)	O/ID	T27665-3
	Shipping crate 1-4, Series 5 (housing size 1, max. 4 units)	O/ID	T27665-4
	Shipping crate 2-2, Series 5 (housing size 2, max. 2 units)	O/ID	T27666-2
	Shipping crate 2-3, Series 5 (housing size 2, max. 3 units)	O/ID	T27666-3
	Shipping crate 2-4, Series 5 (housing size 2, max. 4 units)	O/ID	T27666-4
	Shipping crate 3-1, Series 5 (housing size 3, max. 1 unit)	O/ID	T27667-1



Ordering example: Shipping crate 1-2, Series 5 (O/ID T27665-2)

3.8 Carrier frame with central water supply



Thermo-5, housing size 1


Designation	Type	Level(s)		High mm	Width mm	Depth mm	O/ID
		Units/Level					
		Connection					
		CW	SW				
Carrier frame with castors incl.: - cooling water distribution (CW) Resistance: 10 bar, 100 °C	HB-RA1-2	G¾	-	875	500	930	T25623
	HB-RA1-3	G¾	-	875	690	930	T24923
	HB-RA1-4	G¾	-	875	880	930	T25624
	HB-RA2-2	G¾	-	1550	540	930	T25606
	HB-RA2-3	G¾	-	1550	730	930	T25607
	HB-RA2-4	G¾	-	1610	920	980	T25608
	HB-RA2-5	G¾	-	1610	1110	980	T25609
	HB-RA2-6	G1	-	1610	1310	1060	T25610
	HB-RA2-7	G1	-	1680	1500	1060	T25611
HB-RA2-8	G1	-	1680	1690	1060	T25612	

Carrier frame with castors incl.: - cooling water distribution (CW) - system water distribution (SW) Resistance: 10 bar, 100 °C	HB-RA1-2	G¾	G½	875	500	930	T25625
	HB-RA1-3	G¾	G½	875	690	930	T25626
	HB-RA1-4	G¾	G½	875	880	930	T25627
	HB-RA2-2	G¾	G½	1550	540	930	T25613
	HB-RA2-3	G¾	G½	1550	730	930	T25614
	HB-RA2-4	G¾	G½	1610	920	980	T25615
	HB-RA2-5	G¾	G½	1610	1110	980	T25616
	HB-RA2-6	G1	G¾	1610	1310	1060	T25617
	HB-RA2-7	G1	G¾	1680	1500	1060	T25618
HB-RA2-8	G1	G¾	1680	1690	1060	T25619	
Power distribution with 4 CEKON-sockets 16 A, 3LNPE with individual circuit breakers and central power cord with CEKON-plug 63 A, 3LNPE				460	260	195	T25621
							
Pivoting base for control module 							T25620

Ordering example: Carrier frame with central water supply HB-RA2-4 (O/ID T25615)

Note: Carrier frame for other housing sizes on request

3.9 Keyboard-protection (Thermo-5, Treat-5, Clean-5, Panel-5)

Keyboard-protection		O/ID	ZK
			

4 Manual

4.1 Units (Operating manuals, process descriptions, instruction manuals)

Thermo-5	HB-100X1	O8284-	DE (German)	
	HB-100X1L	O8362-	EN (English)	
	HB-100XM1	O8297-	FR (French)	
	HB-100XM1L	O8363-	BG (Bulgarian)	
	HB-100X2	O8288-	CS (Czech)	
	HB-100X2L	O8368-	DA (Danish)	
	HB-100XM2	O8301-	ES (Spanish)	
	HB-100XM2L	O8370-	FI (Finnish)	
	HB-100X3	O8307-	HU (Hungarian)	
	HB-100XM3	O8309-	IT (Italian)	
	HB-100X4	O8391-	JA (Japanese)	
	HB-100XM4	O8392-	KO (Korean)	
	HB-100/140/160Z1	O8285-	NL (Dutch)	
	HB-100/140/160Z1L	O8360-	PL (Polish)	
	HB-100/140/160ZM1	O8298-	PT (Portuguese)	
	HB-100/140/160ZM1L	O8361-	RO (Romanian)	
	HB-100/140/160/180Z2	O8289-	RU (Russian)	
	HB-100/140/160/180Z2L	O8369-	SK (Slovak)	
	HB-100/140/160/180ZM2	O8302-	SL (Slovene)	
	HB-100/140/160/180ZM2L	O8371-	SV (Swedish)	
	HB-100/140/160/180Z3	O8308-	ZH (Chinese)	
	HB-100/140/160/180ZM3	O8310-		
	HB-100/140/160Z4	O8393-		
	HB-100/140/160ZM4	O8394-		
	HB-200/230Z2B	O8375-		
	HB-200/230ZM2B	O8376-		
	HB-200T2	O8300-		
	HB-200TM2	O8303-		
	HB-250T3	O8318-		
	HB-250TM3	O8319-		
	Thermo-5 (Engel)	HB-100/140/160ZM1LE1	O8367-	
		HB-100/140/160ZM2LE2	O8372-	
	Vario-5	HB-VS180	O8340-	
Process description		O8352-		
Autonomic operation		O8386-		
IR-Temperature sensor		O8343-		
Proximity switch		O8387-		
Flow-5	HB-FM160/180/200	O8295-		
Treat-5	HB-TR2	O8304-		
	Test kit ST-DOS H-314	O8336-		
	Test kit ST-DOS H-390	O8351-		
Clean-5	HB-CL2	O8305-		
	Instruction manual	O8337-		
Panel-5	HB-FB51	O8291-		
	HB-FB52E1 (Engel)	O8366-		
Checking facility	HB-TP180/200	O8354-		
Beer-5	HB-BR2	O8350-		

Ordering example: *Instruction manual Thermo-5, HB-100/140/160Z1, English (O/ID O8285-EN)*

4.2 Other

Interface	Profibus-DP (ZP)	O8241-	DE (German) EN (English)
	Profibus-DP Example	O8293-	
	20 mA, RS-232, RS-422/485 (ZD)	O8099-	
	MODBUS (RTU-Mode)	O8242-	
VIP	Visualisation program	O8975-	

Ordering example: *Manual MODBUS (RTU-Mode), English (O/ID O8242-EN)*