

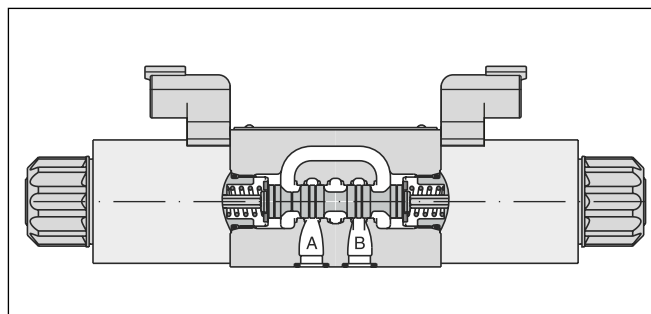
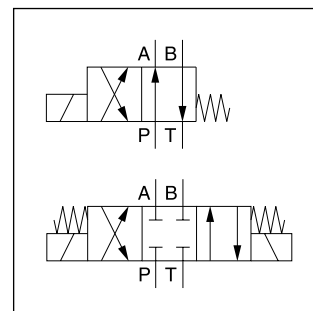
The D1MW is based on the D1VW series of directional control valves size NG06, but offers additional corrosion protection of the valve body, the solenoid coil and the anchor tube as well as the typical solenoid connections for the mobile market such as AMP Junior Timer and DT04-2P "Deutsch".

Technical features

- High corrosion protection (optional)
- Solenoid connection:
 - Standard (as per EN175301-803)
 - AMP Junior Timer
 - DT04-2P "Deutsch"
- Robust design for rough applications
- Extended manual override with rubber cover (optional)



With AMP Junior Timer



Connector DT04-2P "Deutsch"

Technical data

General			
Design		Directional spool valve	
Actuation		Solenoid	
Size		DIN NG06 / CETOP 03 / NFPA D03	
Mounting interface		DIN 24340 A6 / ISO 4401 / CETOP RP 121-H / NFPA D03	
Mounting position		Unrestricted, preferably horizontal	
Ambient temperature	[°C]	-25...+60	
MTTF _D value	[years]	150	
Weight	[kg]	1.5 (1 solenoid), 2.1 (2 solenoids)	
Vibration resistance	[g]	10 Sinus 5...2000 Hz acc. IEC 68-2-6	
		30 Random noise 20...2000 Hz acc. IEC 68-2-36	
		15 Shock acc. IEC 68-2-27	
Hydraulic			
Max. operating pressure	[bar]	P, A B: 350; T: 210	
Fluid		Hydraulic oil according to DIN 51524	
Fluid temperature	[°C]	-20 ... +70 (NBR: -25...+70)	
Viscosity permitted	[cSt] / [mm²/s]	2.8...400	
Viscosity recommended	[cSt] / [mm²/s]	30...80	
Filtration		ISO 4406 (1999); 18/16/13	
Flow max.	[l/min]	80 (see shift limits)	
Leakage at 50 bar	[ml/min]	Up to 10 per flow path, depending on spool	
Static / Dynamic			
Step response at 95 %	[ms]	Energized: 32 De-energized: 40	
Electrical characteristics			
Duty ratio		100 % ED; CAUTION: coil temperature up to 150 °C possible	
Max. switching frequency	[1/h]	15000	
Protection class		Standard (as per EN175301-803) IP65 acc. EN60529 (w. corr. mount. plug-in connector) AMP Junior Timer IP67 in acc. with EN60529 (with correctly mounted plug-in connector) DT04-2P "Deutsch" IP69K (with correctly mounted plug-in connector)	
	Code	K	J
Supply voltage	[V]	12 V =	24 V =
Tolerance supply voltage	[%]	±10	±10
Current consumption hold	[A]	2.72	1.29
Power consumption hold	[W]	32.7	31
Solenoid connection		Connector as per EN 175301-803 (code W), AMP Junior Timer (code A), DT04-2P "Deutsch" connector (code J). Solenoid identification as per ISO 9461.	
Wiring min.	[mm²]	3 x 1.5 recommended	
Wiring length max.	[m]	50 recommended	

With electrical connections the protective conductor (PE $\downarrow$) must be connected according to the relevant regulations.

Ordering Code

Directional Control Valve
Series D1MW**D**Directional
control
valve**1**Size
DIN NG06
CETOP 03
NFFA D03**M**3-chamber
valve for
mobile and
marine
applications**W**Wet pin
armature
solenoid,
threaded
in tubeSpool
typeSpool
position

2

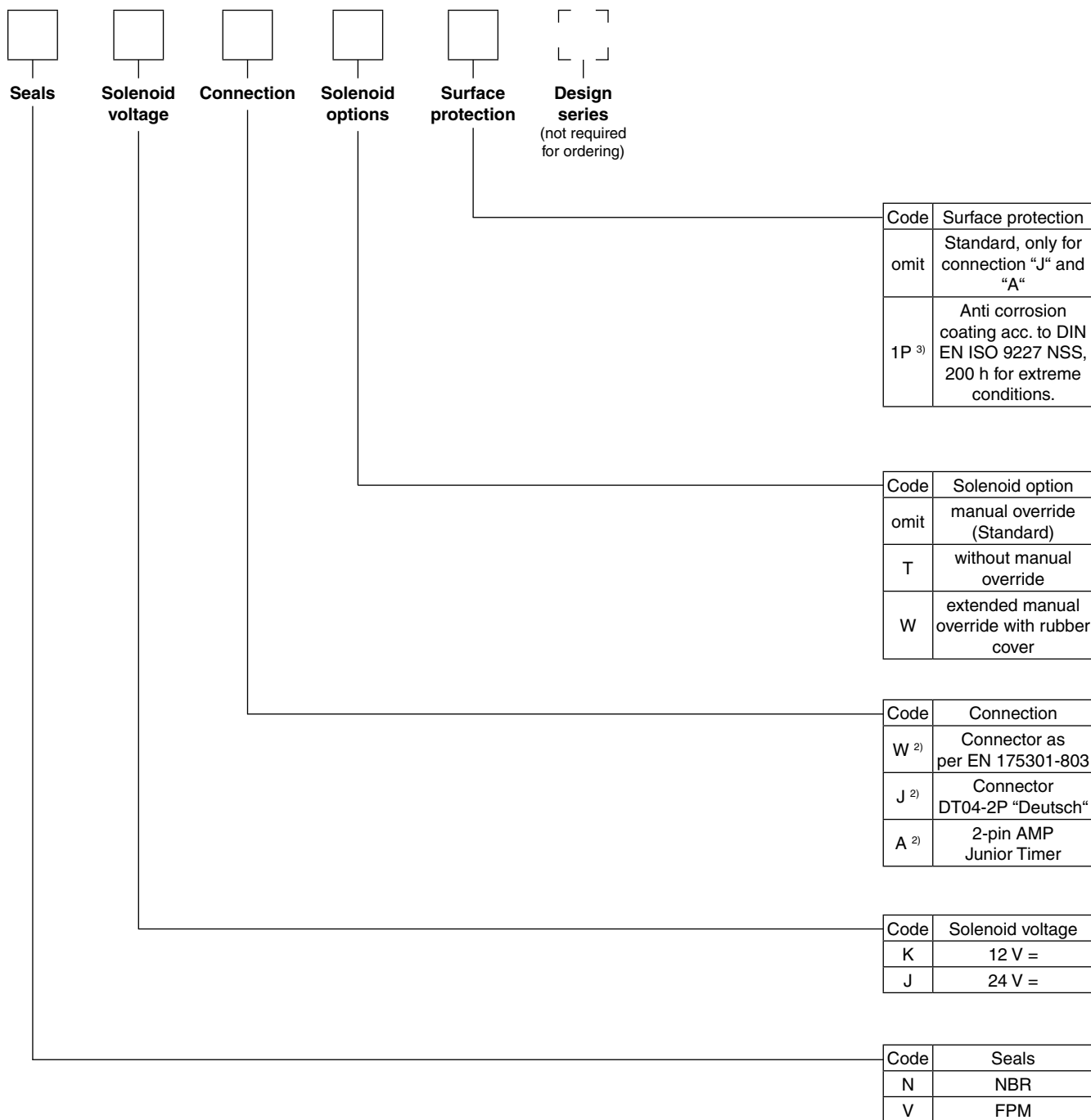
3 position spools	
Code	Spool type
	a 0 b
001	
002	
003	
004	
005	
006	
007	
008 ¹⁾	
009 ¹⁾	
010	
011	
014	
015	
016	
021	
022	
031	
032	
034	
035	
061	
081	
082	
102	
204 ¹⁾	
205 ¹⁾	

2 position spools	
Code	Spool type
	a b
020	
026	
030	
083 ¹⁾	
101	
208	

3 position spools			
Code	Spool position		
C		3 positions. Spring offset in position "0". Operated in position "a" or "b".	
	Standard	Spool type 008, 009, 204, 205	
E	 Operated in position "a".	 Operated in position "b".	2 positions. Spring offset in position "0".
F	 Spring offset in position "b".	 Spring offset in position "a".	2 positions. Operated in position "0".
K	 Operated in position "b".	 Operated in position "a".	2 positions. Spring offset in position "0".
M	 Spring offset in position "a".	 Spring offset in position "b".	2 positions. Operated in position "0".

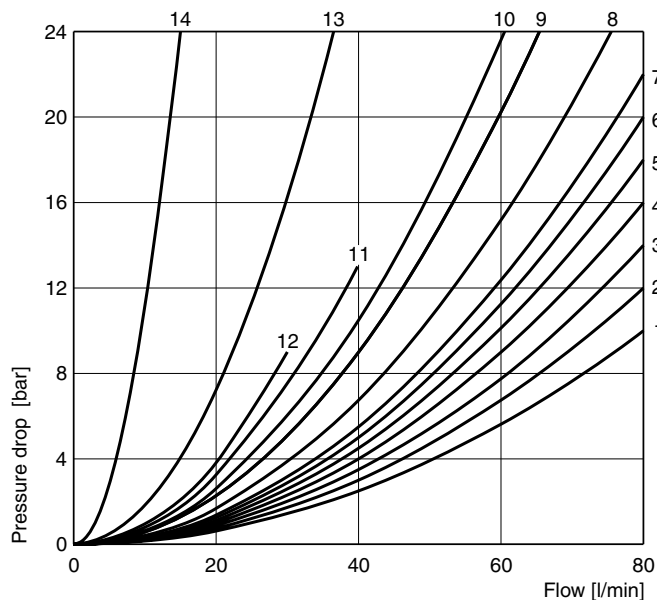
2 position spools			
Code	Spool position		
	Standard	Spool type 083	
B	 Spring offset in position "b". Operated in position "a".		2 positions. Spring offset in position "b". Operated in position "a".
D	 Operated in position "a" or "b". No center or offset position.	—	2 positions. Operated in position "a" or "b". No center or offset position.
H	 Spring offset in position "a". Operated in position "b".		2 positions. Spring offset in position "a". Operated in position "b".

¹⁾ Consider specific spool position.²⁾ Please order plug separately.³⁾ Only in combination with connection "J" and "W".

Ordering Code**Directional Control Valve****Series D1MW****2**

Other spool types on request.

Flow curves



All characteristic curves measured with HLP46 at 50 °C.

Spool	Position "b"			Position "a"			Position "0"				
	P-A	B-T	P-B	P-B	A-T	P-A	P-A	P-B	A-T	B-T	P-T
001	2	2		2	2						
002	1	4		1	4		1	1	5	5	2
003	3	4		3	6				7		
004	2	3		2	3				7	7	
005	2	2		2	2		12				
006	1	4		1	4		7	7			
007	3	2		2	2			3		2	7
010	3			3							
011	2	2		2	2				14	14	
014	3	2		2	2		3		2		7
015	3	6		3	4					7	
016	2	2		2	2			12			
020B	4	4		2	3						
026B	4			4							
030B	2	3		1	2						
034	4		8	3	3				5	7	
035	3	3		4		8			7	5	
081	13	13		13	13						
082	13	13		13	13				1)	1)	
101B	11	10		10	9						
102	1	4		1	4		5	5	8	8	6
61	1	3		1	3		3	2			
83H	5	2		5	2						
208	3			2							
	P-B	A-T		P-A	B-T		P-A	P-B	A-T	B-T	P-T
008	4	5		4	5						9
009	5	5		6	7						7
83B	5	2		5	2						
204	1	3		4	3		7		4		7
205	4	3		1	3			7		4	5

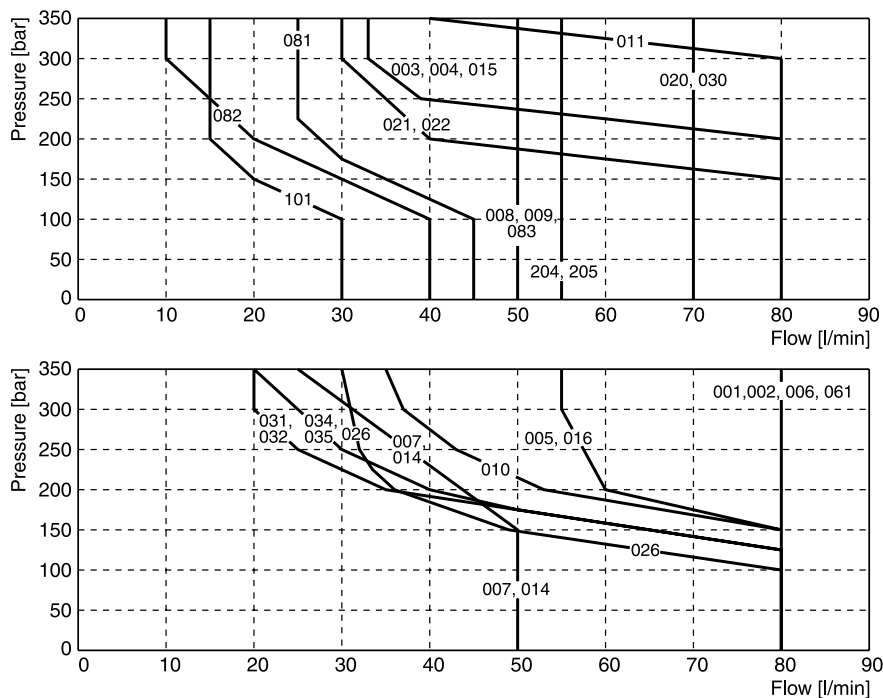
Spool	Position "b"			Position "a"		
	P-A	P-B	A-B	P-B	A-T	
021	2	4		4	2	
	P-A	B-T		P-A	P-B	A-B
022	6	2		5	2	

¹⁾ Only for pressure compensation, no high flow possible.

Shift limits, DC voltage

The diagram below specifies the shift limits for valves with DC & AC solenoids. Valves with spool position “F” or “M” can only be operated up to 70 % of the limits. The specifications apply to a viscosity of 40 mm²/s and bal-

anced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

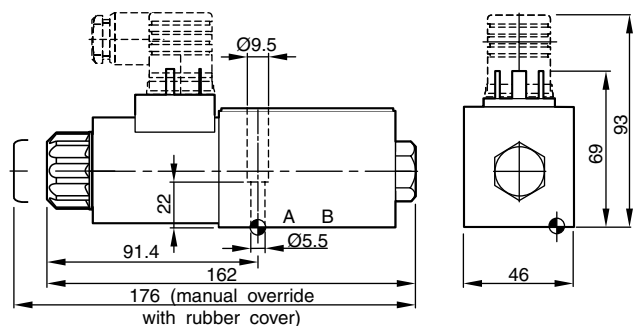


Measured with HLP46 at 50 °C, 90 % U_{nom} and warm solenoids

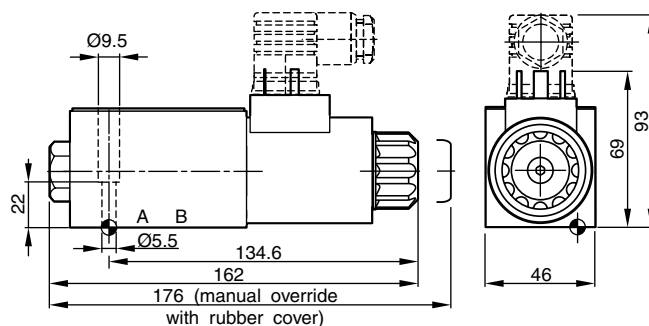
Dimensions

Dimensions with EN 175301-803 Connector

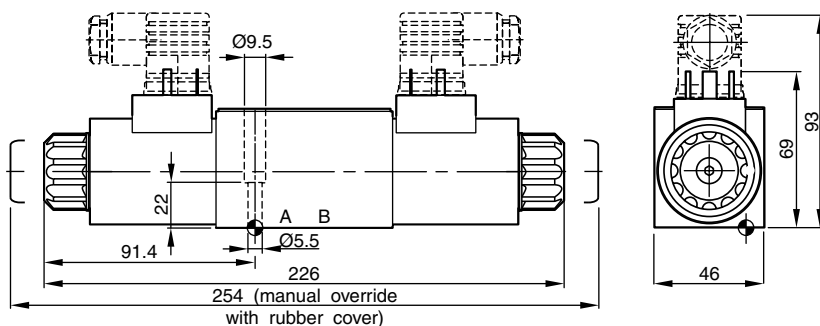
B, E, F -style



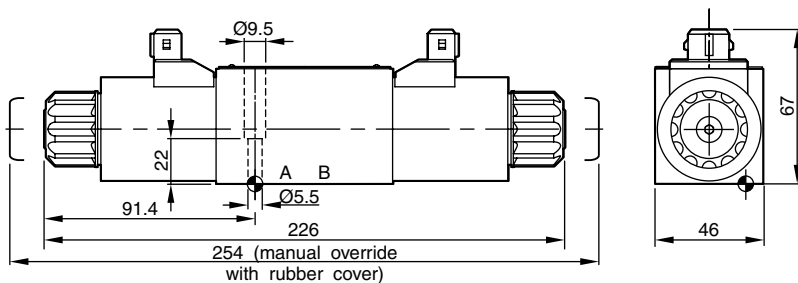
H, K, M -style



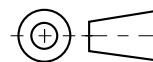
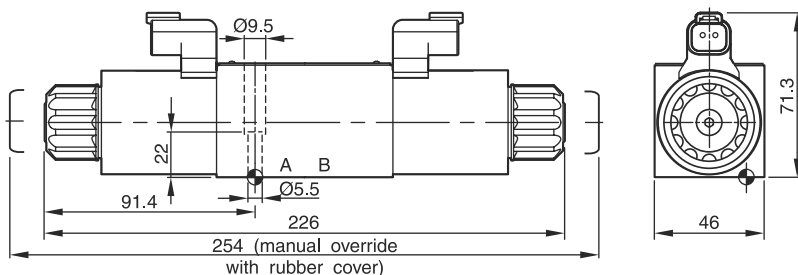
C and D -style

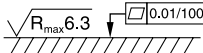


Dimensions with 2pin AMP Junior Timer Connector (only C and D -style shown)



Dimensions with “Deutsch” DT04-2P Connector (only C and D -style shown)



Surface finish	 Kit	 Kit	 Kit	 Kit
	BK375	4x M5x30 ISO 4762-12.9	7.6 Nm ±15 %	NBR: SK-D1VW-N-91 FPM: SK-D1VW-V-91

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.

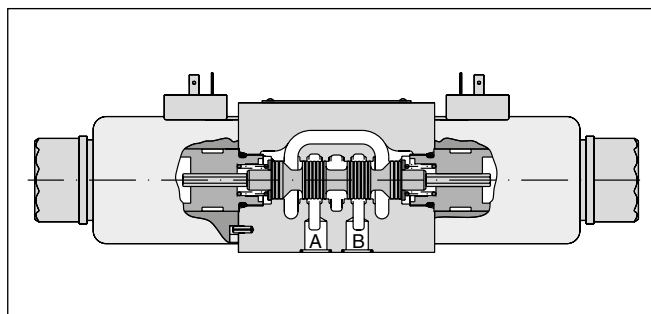
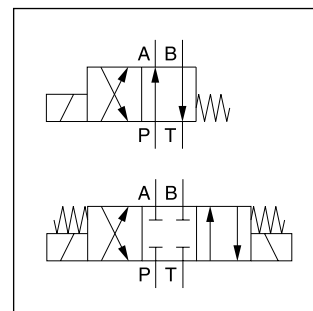
The D3MW is a solenoid operated directional control valve size NG10 in 3-chamber design. It is direct operated by wet pin solenoids.

The D3MW is designed for mobile and marine applications.

It is based on the D3W series, but offers additional corrosion protection of the valve body, the solenoid coil and the anchor tube as well as the typical solenoid connections for the mobile market such as AMP Junior Timer.

Features:

- High corrosion protection (optional)
- Solenoid connection:
 - Standard (as per EN175301-803)
 - AMP Junior Timer
 - DT04-2P "Deutsch"
- Robust design for rough applications

**Technical data**

General	
Design	Directional spool valve
Actuation	Solenoid
Size	DIN NG10 / CETOP 05 / NFPA D05
Mounting interface	DIN 24340 A10 / ISO 4401 / CETOP RP 121-H / NFPA D05
Mounting position	unrestricted, preferably horizontal
Ambient temperature	[°C] -25...+60
MTTF _D value	[years] 150
Weight	[kg] 4.8 (1 solenoid), 6.3 (2 solenoids)
Vibration resistance	[g] 10 Sinus 5...2000 Hz acc. IEC 68-2-6 30 Random noise 20...2000 Hz acc. IEC 68-2-36 15 Shock acc. IEC 68-2-27
Hydraulic	
Max. operating pressure	[bar] P, A B: 350; T: 210
Fluid	Hydraulic oil according to DIN 51524
Fluid temperature	[°C] -20 ... +70 (NBR: -25...+70)
Viscosity permitted	[cSt] / [mm²/s] 2.8...400
Viscosity recommended	[cSt] / [mm²/s] 30...80
Filtration	ISO 4406 (1999); 18/16/13
Flow max.	[l/min] 150 (see shift limits)
Leakage at 50 bar	[ml/min] Up to 20 per flow path, depending on spool
Static / Dynamic	
Step response at 95 %	[ms] Energized: 105 De-energized: 85
Electrical characteristics	
Duty ratio	100 % ED; CAUTION: coil temperature up to 150 °C possible
Max. switching frequency	[1/h] 10000
Protection class	Standard (as per EN175301-803) IP65 in acc. with EN60529 (with correctly mounted plug-in connector) AMP Junior Timer IP67 in acc. with EN60529 (with correctly mounted plug-in connector) DT04-P2 "Deutsch" IP69K (with correctly mounted plug-in connector)
Code	K J
Supply voltage / ripple	[V] 12 V = 24 V =
Tolerance supply voltage	[%] ±10 ±10
Current consumption	[A] 3 1.5
Power consumption	[W] 36 36
Solenoid connection	Connector as per EN 175301-803 (code W), AMP Junior Timer (code A), DT04-2P "Deutsch" connector (code J). Solenoid ident. as per ISO 9461.
Wiring min.	[mm²] 3 x 1.5 recommended
Wiring length max.	[m] 50 recommended

With electrical connections the protective conductor (PE $\downarrow$) must be connected according to the relevant regulations.

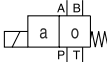
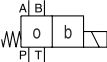
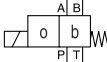
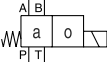
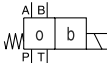
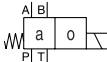
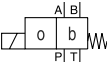
Ordering Code

Directional Control Valve
Series D3MW**D**Directional
control
valve**3**Size
DIN NG10
CETOP 05
NFA D05**M**3-chamber
valve for
mobile and
marine
applications**W**Wet pin
solenoidSpool
typeSpool
position

2

3 position spools	
Code	Spool type
	a 0 b
001	
002	
003	
004	
005	
006	
007	
008 ¹⁾	
009 ¹⁾	
010	
011	
012	
014	
015	
016	
021	
022	
031	
032	
081	
082	
102	

2 position spools	
Code	Spool type
	a b
020	
026	
030	
101	

3 position spools			
Code	Spool position		
C		3 positions. Spring offset in position "0". Operated in position "a" or "b".	
	Standard	Spool type 008, 009	
E	 Operated in position "a".	 Operated in position "b".	2 positions. Spring offset in position "0".
F	 Spring offset in position "b".	 Spring offset in position "a".	2 positions. Operated in position "0".
K	 Operated in position "b".	 Operated in position "a".	2 positions. Spring offset in position "0".
M	 Spring offset in position "a".	 Spring offset in position "b".	2 positions. Operated in position "0".

2 position spools		
Code	Spool position	
B		2 positions. Spring offset in position "b". Operated in position "a".
D		2 positions. Operated in position "a" or "b". No center or offset position.
H		2 positions. Spring offset in position "a". Operated in position "b".

¹⁾ Consider specific spool position.²⁾ Please order plug separately.³⁾ Only for voltage 24 V=.

Ordering Code**Directional Control Valve****Series D3MW****2****Seals****Solenoid
voltage****Connection****Solenoid
options****Surface
protection****Design
series**
(not required
for ordering)

Code	Surface protection
omit	Standard, only for connection "J" and "A"
1P	Anti corrosion coating acc. to DIN EN ISO 9227 NSS, 200 h for extreme conditions.

Code	Solenoid option
omit	manual override (Standard)
T	without manual override

Code	Connection
W ²⁾	Connector as per EN 175301-803
A ^{2) 3)}	2-pin AMP Junior Timer
J ^{2) 3)}	Connector DT04-P2 "Deutsch"

Code	Voltage
K	12 V=
J	24 V=

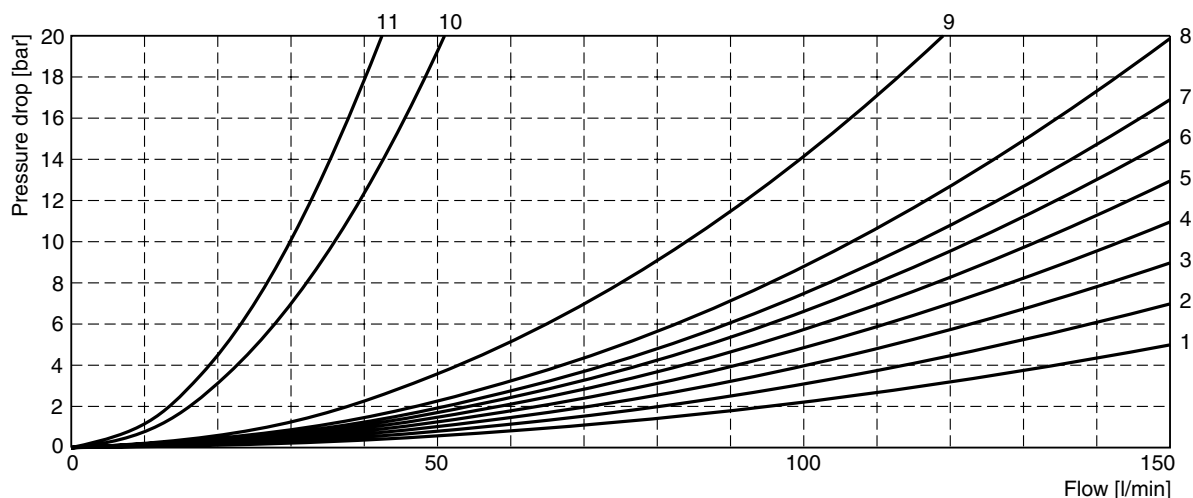
Code	Seals
N	NBR
V	FPM

Further spool types on request.

Flow curves

The flow curve diagram shows the flow versus pressure drop curves for all spool types. For each spool type,

operating position and flow direction the relevant curve number is given in the table below.



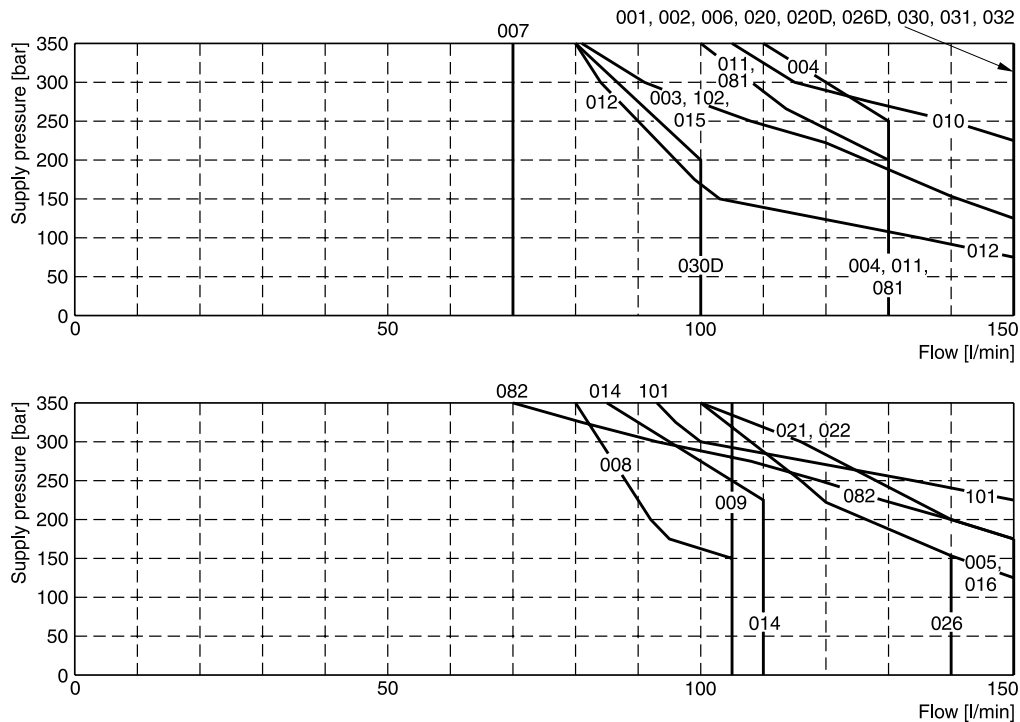
All characteristic curves measured with HLP46 at 50 °C.

Spool	Position b		Position a		Position 0					
	P->A	B->T	P->B	A->T	P->A	P->B	A->T	B->T	P->T	A->B
001	6	5	6	6	—	—	—	—	—	—
002	3	5	3	3	1	1	4	5	1	6
003	2	2	3	1	—	—	3	—	—	—
004	5	4	4	4	—	—	8	8	—	9
005	2	2	2	2	3	—	—	—	—	—
006	1	2	1	3	2	2	—	—	—	3
007	2	1	2	2	—	1	—	2	3	—
010	2	—	2	—	—	—	—	—	—	—
011	2	2	2	2	—	—	11	11	—	11
012	1	2	2	2	10	10	10	10	11	11
014	1	2	2	2	1	—	2	—	3	—
015	2	1	2	2	—	—	—	3	—	—
016	2	2	1	2	—	2	—	—	—	—
020	6	6	5	7	—	—	—	—	—	—
026	5	—	5	—	—	—	—	—	—	—
030	4	5	3	5	—	—	—	—	—	—
	P->B	A->T	P->A	B->T	P->A	P->B	A->T	B->T	P->T	A->B
008	8	7	7	6	—	—	—	—	9	—
009	4	4	5	8	—	—	—	—	9	—
Position b				Position a						
	P->A	P->B	A->B	P->B	A->T					
021	2	4	8	3	2					
	P->A	B->T		P->A	P->B	A->B				
022	3	2		3	2	8				

Shift limits, DC voltage

The diagrams below specify the shift limits for valves with DC and AC solenoids. Valves with spool position “F” or “M” can only be operated up to 70 % of the limits. The specifications apply to a viscosity of 40 mm²/s and bal-

anced flow conditions. The shift limits can be considerably lower at unbalanced flow conditions. To avoid flow rates beyond the shift limits, a plug-in orifice can be inserted in the P-port.

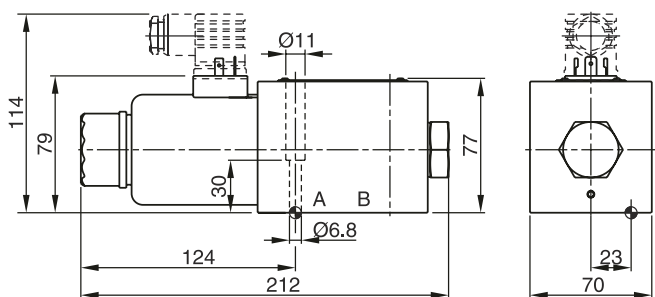


Measured with HLP46 at 50 °C, 90 % U_{nom} and warm solenoids.

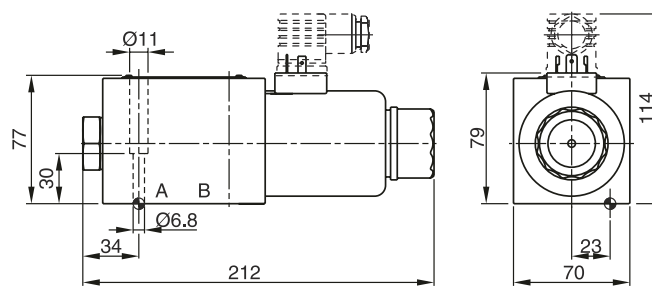
Dimensions

Interface EN 175301-803

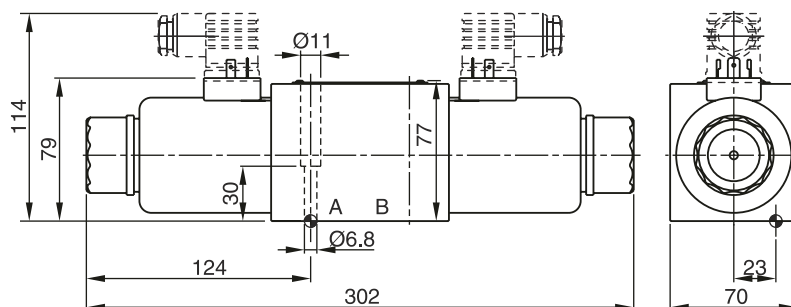
B, E, F -style



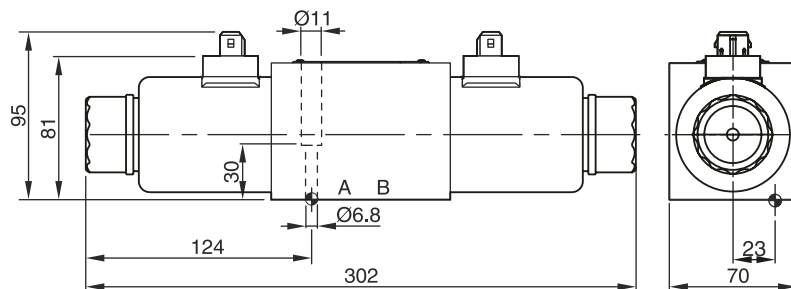
H, K, M -style



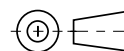
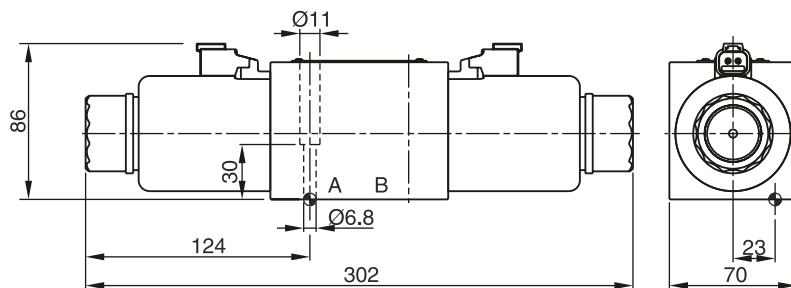
C, D -style



Dimensions with AMP Connector (only C and D -style shown)



Dimensions with DT04-P2 "Deutsch" Connector (only C and D -style shown)



Surface finish	Kit	Kit	Kit	Kit
$\sqrt{R_{\max} 6.3}$ $\square 0.01/100$	BK385	4x M6x40 ISO 4762-12.9	13.2 Nm $\pm 15\%$	NBR: SK-D3W-N-30 FPM: SK-D3W-V-30

The space necessary to remove the plug per EN 175301-803, design type AF is at least 15 mm.
The torque for the screw M3 of the plug has to be 0.5 to 0.6 Nm.