

# Direct-acting 2/2- or 3/2-way pivoted armature valve

FLUID CONTROL SYSTEMS

- Direct-acting, media-separated valve with diameter of up to DN 5
- Maintenance-free pivoted armature technology
- Vibration-proof, block screwed coil system
- Suitable for aggressive alkaline and acidic solutions
- Service-friendly, robust manual operation
- Explosion proof versions

The 0330 valve is a direct-acting, media-separated pivoted armature valve. It is available in 3/2- and 2/2-way versions. As a 3/2-way version, it can be used as a distributor or mixing valve. Various diaphragm material combinations and methods of operation are available depending on the application. The standard brass housing satisfies all European drinking water requirements. Stainless steel (316), PVDF, and polypropylene housing versions complete the offering. The solenoid coils are moulded with a chemically resistant epoxy. The 0330 is equipped with manual override for commissioning and testing. For reduced energy requirements all coils can be delivered with electronic power reduction or as an impulse version. The switching status can be indicated with position feedback as a binary or NAMUR signal. In combination with a plug in accordance with DIN EN 17301-803 Form A, the valves satisfy protection class IP65/67 - in combination with a stainless steel or plastic housing NEMA 250 Cat. 4X.

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<b>Explosion proof version</b> Technical data Additional options Dimensions & Pin Assignment Ordering chart	р. 7 р. 9 р. 10 р. 11

Technical data								
Available housing materials	Brass Stainless steel (1.4401) PP (Polypropylene) PVDF (Polyvinylfluoride)							
Port	G 1/4; NPT 1/4;							
connection	(RC 1/4 and G 1/8 on request)							
Seal material	EDPM / FKM / FFKM / NBR							
Medium								
for NBR	Neutral medium such as compressed air, town gas, water,							
	hydraulic oil, oils and fats without additives, oxygen							
EPDM	Alkalis, acids to medium concentrations, alkaline washing							
	and bleaching lyes							
for FKM	Oxydizing acids and substances, hot oils with additives,							
	salt solutions, waste gases, oxygen							
for FFKM	aggressive mediums, hot air, hot oils							
All Materials - For more exact i	nfo. please refer to our chemical resistance chart							
Medium temperature	NBR 0 to +80 °C							
for body material	EPDM -30 to +90 °C							
brass or stainless steel	FKM 0 to +90 °C							
	FFKM +5 to +90 °C							
Medium temperature	NBR 0 to +80 °C							
for body material	EPDM -30 to +80 °C							
PP or PVDF	FKM 0 to +80 °C							
	FFKM +5 to +80 °C							
Viscosity	Max. 37mm²/s							
Ambient temperature	max. +55 °C							
Voltages	24V 50Hz; 110V 50Hz; 230V 50Hz; 120V 60Hz;							
	240V 60Hz; 12V DC; 24V DC;							
	(further voltages on request)							
Voltage tolerance	+/- 10%							
Duty cycle for brass and	100%							
stainless steel.								
Duty cycle for PP and PVDF	40% ED (60% intermittent operation) in 30min for 8W							
	version 100% ED for 5W version							

W

1 (P)

2(B)

2(IN/OUT)

#### **Circuit function**

- A 2/2-way direct acting valve, normally closed
- B 2/2-way direct acting valve, normally open
- C 3/2-way valve, direct acting, when de-energised Port A exhausted
- D 3/2-way valve, servo-assisted, outlet B normally pressurized
- E Mixer valve, direct-acting, in de-energized position, P2→A open, P1 closed
- F Distribution valve, direct-acting, in de-energized positon, P→B open, A closed
  4(A) 2(B)
  ↓↓↓↓
- T 3/2 way valve, universal function, flow direction as required

# Technical data (continued)

Electrical connection	Pin terminal acc. to DIN EN 175301-803 Form A for cable
	pug Type 2508/2509
	(also on request with moulded cable or terminal box)
Protection class	IP65 with Cable Plug
Coil insulation class	Н
Installation	As required, preferably with actuator upright
Weight [kg]	
with metal body	0.47
with plastic hausing	0.40

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## Standard power consumption

Frequency AC Inrush [VA]	Hold [VA]		Frequency DC Cold [W]	Warm [W]
30	15	8	11	8

#### Impulse (inrush winding)

Frequency AC Hold [VA]	Operation [W]	Frequency DC Cold [W] Warm [W]					
20	11	11	8				

#### **Response times**

Orifice [mm]	Frequency AC Opening [ms]	Closing [ms]	Frequency DC Opening [ms]	Closing [ms]	
2-4	8-15	8-15	10-20	10-20	

#### Response times [ms]:

Measured at valve outlet at 6 bar and +20 °C Opening: Pressure rise 0 to 90%, Closing: Pressure drop 100 to 10%

## Pressure range and flow rate for metal body

Circuit function	DN	Kv value	water [m <sup>3</sup> /h]:	Si	tandard <sup>1)</sup>	Impulse 2)	
		DC	AC [50 or 60Hz]	Pressure range <sup>4)</sup> [bar]	Vacuum <sup>3)</sup> Pressure range <sup>4)</sup> [bar]	Pressure range <sup>4)</sup> [bar]	
A/B/C/D/F	2.0	0.08	0.11	0 - 16 5)	-0.98 - 10	0 - 16 5)	
	3.0	0.14	0.18	0 - 10	-0.98 - 6	0 - 10	
	4.0	0.17	0.23	0 - 5	-0.98 - 3	0 - 5	
	5.0	0.29	0.29	0 - 2.5	-0.98 - 1	0 - 2.5	
E	2.0	0.08	0.11	0 - 10	-0.98 - 8	0 - 10	
	3.0	0.14	0.18	0 - 6	-0.98 - 5	0 - 6	
	4.0	0.17	0.23	0 - 3	-0.98 - 2.5	0 - 3	
	5.0	0.29	0.29	0 - 1.5	-0.98 - 1	0 - 1	
Т	2.0	0.08	0.11	0 - 12	-0.98 - 8	0 - 10	
	3.0	0.14	0.18	0 - 8	-0.98 - 5	0 - 6	
	4.0	0.17	0.23	0 - 4	-0.98 - 2.5	0 - 5	
	5.0	0.29	0.29	0 - 2.5	-0.98 - 1	-	

## Pressure range and flow rate for plastic body

Circuit function	DN	Kv value water [m³/h] <sup>6)</sup>	Standard <sup>1)</sup> Pressure range <sup>4)</sup> [bar] AC [50 or 60Hz]	Pressure range <sup>4)</sup> [bar] DC	Vacuum Pressure range 4) [bar]	Impulse <sup>2)</sup> Pressure range <sup>4)</sup> [bar]
A/B/C/D/F	2.0	0.13	0 - 16 5)	0 - 12	-0.98 - 10	0 - 12
	3.0	0.25	0 - 10	0 - 8	-0.98 - 6	0 - 8
	4.0	0.30	0 - 5	0 - 4	-0.98 - 3	0 - 4
	5.0	0.40	0 - 4.5	0 - 3	-0.98 - 1	0 - 3
E/T	2.0	0.13	0 - 10	0 - 7	-0.98 - 7	0 - 7
	3.0	0.25	0 - 6	0 - 4	-0.98 - 5	0 - 4
	4.0	0.30	0 - 3	0 - 2	-0.98 - 2.5	0 - 2

<sup>1)</sup> Rated power consumtion 8W

<sup>2)</sup> Inrush power 11W

3) Vacuum possible for all seal materials

<sup>4)</sup> Pressure values [bar] with respect to atmospheric pressure

 $^{\rm 5)}$  For seal material FKM and FFKM the max. mediums pressure is 12 bar

 $^{\rm 6)}$  At frequency DC the  $\rm K_v$  value is reduced till 10% to fulfil the function





## Other circuit functions

The valves are fitted with different springs for a specific circuit function. When used in other circuit functions the permissable operating pressure changes acc. to the following table.

Metal body	Metal body (8W respectively 11W)																	
Circuit Max. operating pressure [bar] when using the valve in a new circuit function																		
function	Orifice 2mm						Orifice 3mm Or				Orific	Prifice 4mm						
	A1)	<b>B</b> <sup>1)</sup>	С	D	E	F	Α	В	С	D	E	F	Α	В	С	D	E	F
С	16	1.5	16	1.5	1.5	16	10	1	10	1	1	10	5	0.8	5	0.8	0.8	5
D	4	16	4.5	16	4	4	2.5	10	2.5	10	2	3	2	5	2	5	2	2
Т	8	8	10	10	10	8	6	6	6	6	6	6	3	3	3	3	3	3

Plastic boo	Plastic body (8W respectively 11W)																	
Circuit Max. operating pressure [bar] when using the valve in a new circuit function																		
function	Orifice 2mm						Orific	Orifice 3mm O					Orific	Orifice 4mm				
	<b>A</b> <sup>1)</sup>	<b>B</b> 1)	С	D	E	F	Α	В	С	D	E	F	Α	В	С	D	E	F
С	16	1.5	16	1.5	1.5	16	10	1	10	1	1	10	5	0.8	5	0.8	0.8	5
D	4	16	4.5	16	4	4	2.5	10	2.5	10	2	3	2	5	2	5	2	2
F	16	1.5	10	1.5	1.5	16	6	1	6	1	1	10	4	1	4	1	1	5

<sup>1)</sup> For circuit function A and B the valve must be connected acc. to the pin assignment of 3/2-way valve.

# Additional options





# Additional options

Option	Variable Code	Description						
Impulse version	CF02	Bistable magnetic system with inrush and drop-off coil;Continuous opera- tion or operation with short current pulses (min. 150 ms) possible						
Oxygen versions	NL02	Suitable for applications with oxygen (non-metal materials that are in contact with the medium, are tested and approved according to BAM)						
Increased purity requirements e.g. oil, grease and silicone-free	NL50/NL05	Wetted parts are specially cleaned and packaged in accordance with the valves						
Increased tightness requirements	PCxx	Standard units are tested at 10 <sup>-2</sup> mbar x I / sec; feasible up to 10 <sup>6</sup> mbar						
Electrical feedback	LF02 / LF03	See Type 1060						
High-power electronics	CZ05	Inrush power 60 W, nominal holding current 3 W; with plastic versions 100% ED is now feasible						
Vacuum version	NA02	Suitable for vacuums up to -0.98bar						
Increased purity and tightness requirements	NA03	Wetted parts are specially cleaned and leak tested to 10 <sup>-4</sup> mbar x l/sec						
Increased purity and tightness requirements and vacuum version	NA01	Wetted parts are specially cleaned and leak tested up to $10^{-4}$ mbar x l/sec and suited for vacuum up to -0.98 bar						
Coil with reduced power (5W)		Devices have lower pressure range; with plastic versions 100% ED is now feasible						
Cable plug	JFxx / JGxx	Cable plug is included in delivery. Cable plug versions (acc. to DIN EN 175301-803 Form A), see datasheet Type 2508 and 2509						
Approvals	PD01	CSA General Purpose valve						
	PD02	CSA General Purpose valve UL recognized General Purpose valve						
	PD24	UL listed Genaral Purpose valve CSA Genaral Purpose valve FM non-incendive for class I / II / III Div.2 T4						
	PD45	FM explosionproof for class I Div. 1 and dust-ingnitionproof for class II / III Div. 1 T4 CSA General Purpose valve for hazardous location class I / II Div. 2 and class III T4						
	PD07	DNV-GL (formerly Germanischer Lloyd)						
possible conformities (depending on the assembly)		EAC, trinking water, FDA						





# Dimensions [mm]



# Port connections

The connections marked with 1, 2 and 3 are labelled in the drawing according to the circuit function table.





# Ordering chart (products with reduced delivery time)

All devices with connection thread G 1/4, manual override and cable plug Type 2508

				Item no. p	per voltage/frequer	ncy [V/Hz]
Circuit function	Orifice [mm]	Seal Material	Housing or seat material	024/DC	024/50	230/50
A <sup>2)</sup>	3.0	FKM	Brass	020 293	022 883	124 909
	3.0	FKM	Stainless steel	020 292	023 984	024 563
	3.0	FKM	PP	018 410	088 496	045 653
	3.0	FKM	PVDF	018 188	020 286	069 006
	3.0	NBR	Brass	020 294	086 553	024 902
	3.0	EPDM	PP	067 214	022 105	062 398
	4.0	FKM	Brass	024 019	025 246	124 912
	4.0	FKM	Stainless steel	018 276	018 857	020 873
	4.0	FKM	PP	062 695	043 005	063 116
	4.0	FKM	PVDF	023 472	069 079	087 837
	4.0	NBR	Brass	025 084	-	046 007
	4.0	EPDM	PP	021 660	067 731	063 118
	4.0	EPDM	PVDF	057 573	-	125 507
	5.0	FKM	PP	062 624	067 007	022 619
	5.0	FKM	PVDF	064 512	-	063 786
	5.0	EPDM	PP	061 321	054 261	049 969
	5.0	EPDM	PVDF	120 184	059 802	130 117
B <sup>2)</sup>	3.0	FKM	Brass	141 917	130 146	141 919
	4.0	FKM	Brass	141 920	141 921	141 923
	3.0	FKM	Stainless steel	141 928	141 929	141 931
	4.0	FKM	Stainless steel	141 932	141 933	141 935
С	2.0	NBR	Brass	041 103	042 129	041 105
0	3.0	NBR	Brass	041 107	041 108	041 116
	3.0	FKM	Stainless steel	052 344	045 024	052 059
	4.0	NBR	Brass	042 218	042 695	042 329
	4.0	FKM	Stainless steel	050 483	043 324	050 979
	4.0	FKM	PP	-	088 420	-
	4.0	FKM	PVDF	055 788	-	019 078
	4.0	EPDM	PP	-	-	063 625
D	2.0	NBR	Brass	056 984	041 858	041 137
	3.0	NBR	Brass	041 139	041 141	041 147
	4.0	NBR	Brass	043 129	042 696	042 903
E	3.0	FKM	PP	069 917	066 230	022 294
	3.0	EPDM	PP	078 556	-	078 559
	4.0	FKM	PP	061 077	086 921	053 406
	4.0	FKM	PVDF	022 340	020 550	085 599
	4.0	EPDM	PP	067 160	044 693	066 033
F	4.0	FKM	PP	020 528	-	-
	4.0	EPDM	PP	-	-	066 032
Т	2.0	FKM	Brass	124 922	138 316	124 925
	3.0	FKM	Brass	124 927	124 928	124 930
	2.0	FKM	Stainless steel	124 932	124 933	124 935
	3.0	FKM	Stainless steel	124 937	124 938	124 940

<sup>2)</sup> The listed ID numbers and circuit functions have a body with a straight channel

Note: Further versions on request

## Order chart for accessories





**Circuit function** 

exhausted

A 2/2-way direct acting valve, normally closed

**B** 2/2-way direct acting valve, normally open

C 3/2-way valve, direct acting,

when de-energised Port A

D 3/2-way valve, servo-assisted,

E Mixer valve, direct-acting,

in de-energized position,

P2→A open, P1 closed

P→B open, A closed

T 3/2 way valve, universal

required

function, flow direction as

F Distribution valve, direct-acting, in de-energized positon,

outlet B normally pressurized

# Explosion proof version

waste gases, oxygenfor FFKMAggressive mediums, hot air, hot oilsAll Materials - For more exact info. please refer to our chemical resistance chartMedium temperature for body materialNBR0 to +80 °CBrass or stainlessFKM0 to +90 °CsteelFFKM +5 to 90°CMedium temperature for body materialNBR0 to +80 °CPor PVDFFKM0 to +80 °CFP or PVDFFKM0 to +80 °CViscosityMax. 37mm²/sAmbient temperature. Max. 455°CMax. 455°CVoltages24V, 230V (further voltages on request)FrequencyAC/DCVoltage tolerance+/- 10%Duty cycle100%Electrical connection Coil insulation classIP65Coil insulation classIP65									
materials       PVDF (Polyvinylfluoride)         Port connection       G 1/4; NPT 1/4; (RC 1/4 and G 1/8 on request)         Seal material       EDPM / FKM / FFKM / NBR         Medium       For NBR       Neutral medium such as compressed air, town gas, water, hydraulic oil, oils and fats without additives, oxygen         for NBR       Neutral medium such as compressed air, town gas, water, hydraulic oil, oils and fats without additives, oxygen         for FPDM       Alkalis, acids to medium concentrations, alkaline washing and bleaching lyes         for FFKM       Oxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygen         for FFKM       Aggressive mediums, hot air, hot oils         All Materials - For more exact info. please refer to our chemical resistance chart         Medium temperature       NBR       0 to +80 °C         for body material       EPDM       -30 to +90 °C         Ber 0 to +80 °C       Medium temperature       NBR       0 to +80 °C         FKM       90 °C       Medium temperature       Nax. 37mm²/s         Medium temperature.       Nax. 37mm²/s       Max. 37mm²/s         Ambient temperature.       Max. 37mm²/s       Max. 37mm²/s         Voltages       24V, 230V (further voltages on request)       Frequency         Frequency       AC/DC       Moulded cable (For more detailed inf	Technical data								
Port connection       G 1/4; NPT 1/4; (RC 1/4 and G 1/8 on request)         Seal material       EDPM / FKM / FFKM / NBR         Medium <ul> <li>for NBR</li> <li>Neutral medium such as compressed air, town gas, water, hydraulic oil, oils and fats without additives, oxygen</li> <li>for EPDM</li> <li>Alkalis, acids to medium concentrations, alkaline washing and bleaching lyes</li> <li>for FKM</li> <li>Oxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygen</li> <li>for FFKM</li> <li>Aggressive mediums, hot air, hot oils</li> <li>All Materials - For more exact info. please refer to our chemical resistance chart</li> <li>Medium temperature</li> <li>for body material</li> <li>EPDM -30 to +80 °C</li> <li>brass or stainless</li> <li>FFKM +5 to 90°C</li> <li>Medium temperature</li> <li>NBR 0 to +80 °C</li> <li>FFKM +5 to +80 °C</li> <li>Yiscosity</li> <li>Max. +75°C</li> <li>Voltages</li> <li>24V, 230V (further voltages on request)</li> <li>Frequency</li> <li>AC/DC</li> <li>Voltage tolerance</li> <li>H -10%</li> <li>Duty cycle</li> <li>100%</li> <li>Electrical connection</li> <li>Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1)</li> <li>Terminal box without safety fuse</li> <li>Protection class</li> <li>IP65</li> </ul> <li>Coil insulation class</li> <li>H</li>	Available body	Brass, stainless steel (1.4401), PP (Polypropylene)							
Seal material       EDPM / FKM / FFKM / NBR         Medium       oil, oils and fats without additives, oxygen         for NBR       Neutral medium such as compressed air, town gas, water, hydraulic oil, oils and fats without additives, oxygen         for EPDM       Alkalis, acids to medium concentrations, alkaline washing and bleaching lyes         for FKM       Oxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygen         for FFKM       Aggressive mediums, hot air, hot oils         All Materials - For more exact info. please refer to our chemical resistance chart         Medium temperature       NBR         for body material       EPDM - 30 to +80 °C         brass or stainless       FKM         for body material       EPDM - 30 to +80 °C         FKM       Yot +80 °C         for body material       EPDM - 30 to +80 °C         FKM       to +80 °C         FKM       to +80 °C         FKM       to +80 °C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. 455°C         Voltages       24V, 230V (further voltages on request)         Frequency       Ac/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cab	materials								
Medium         for NBR       Neutral medium such as compressed air, town gas, water, hydraulic oil, oils and fats without additives, oxygen         for EPDM       Alkalis, acids to medium concentrations, alkaline washing and bleaching lyes         for FKM       Oxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygen         for FFKM       Aggressive mediums, hot air, hot oils         All Materials - For more exact info. please refer to our chemical resistance chart         Medium temperature for body material       NBR       0 to +80 °C         EPDM       -30 to +90 °C         Steel       FFKM       0 to +80 °C         For body material       PDM       -30 to +80 °C         PP or PVDF       FKM       0 to +80 °C         FFKM       +5 to 90°C       EPDM         Medium temperature for body material       NBR       0 to +80 °C         PP or PVDF       FKM       0 to +80 °C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the i	Port connection								
for NBR       Neutral medium such as compressed air, town gas, water, hydraulic oil, oils and fats without additives, oxygen         for EPDM       Alkalis, acids to medium concentrations, alkaline washing and bleaching lyes         for FKM       Oxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygen         for FFKM       Aggressive mediums, hot air, hot oils         All Materials - For more exact info. please refer to our chemical resistance chart         Medium temperature for body material       NBR       0 to +80 °C         EPDM       -30 to +90°C         Medium temperature for body material       FKM       0 to +80 °C         Pp or PVDF       FKM       0 to +80 °C         PP or PVDF       FKM       0 to +80 °C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H	Seal material								
oil, oils and fats without additives, oxygen         for EPDM       Alkalis, acids to medium concentrations, alkaline washing and bleaching lyes         for FKM       Oxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygen         for FFKM       Aggressive mediums, hot air, hot oils         All Materials - For more exact info. please refer to our chemical resistance chart         Medium temperature       NBR       0 to +80 °C         for body material       EPDM -30 to +90 °C         brass or stainless       FKM       0 to +80 °C         for body material       EPDM -30 to +80 °C         Medium temperature       NBR       0 to +80 °C         for body material       EPDM -30 to +80 °C         PP or PVDF       FKM       0 to +80 °C         FKM       5 to 90°C       100 to +80 °C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1)         Terminal box without safety fuse       Protection class	Medium								
for EPDMAlkalis, acids to medium concentrations, alkaline washing and bleaching lyesfor FKMOxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygenfor FFKMAggressive mediums, hot air, hot oilsAll Materials - For more exact info. please refer to our chemical resistance chartMedium temperature for body materialNBR0 to +80 °CFKMOto +90 °Cbrass or stainlessFKM0 to +90 °CMedium temperature for body materialNBR0 to +80 °CPP or PVDFFKM0 to +80 °CFKM90 °CMedium temperature for body materialNBR0 to +80 °CPP or PVDFFKM0 to +80 °CFKM90 °CFKM90 °CMedium temperature for body material EPDM -30 to +80 °CPP or PVDFFKM0 to +80 °CFFKM+5 to +80 °CViscosityMax. 37mm²/sAmbient temperature. Voltages24V, 230V (further voltages on request)Frequency Voltage tolerance Electrical connection Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuseProtection class Coil insulation classIP65	for NBR	Neutral medium such as compressed air, town gas, water, hydraulic							
for FKM       Oxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygen         for FFKM       Aggressive mediums, hot air, hot oils         All Materials - For more exact info. please refer to our chemical resistance chart         Medium temperature for body material       EPDM -30 to +80 °C         FKM       0 to +90 °C         steel       FFKM +5 to 90°C         Medium temperature for body material       EPDM -30 to +80 °C         Medium temperature for body material       EPDM -30 to +80 °C         FKM       +5 to 90°C         Medium temperature for body material       EPDM -30 to +80 °C         PD or PVDF       FKM       0 to +80 °C         FFKM       +5 to 90°C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1)         Terminal box without safety fuse       Protection class         Protection class       IP65         Coil insulation class       H		oil, oils and fats without additives, oxygen							
for FKMOxydizing acids and substances, hot oils with additives, salt solutions waste gases, oxygenfor FFKMAggressive mediums, hot air, hot oilsAll Materials - For more exact info. please refer to our chemical resistance chartMedium temperature for body materialNBR0 to +80 °CEPDM-30 to +90 °CsteelFFKM+5 to 90°CMedium temperature for body materialNBR0 to +80 °CPor PVDFFKM+5 to 90°CMedium temperature for body materialNBR0 to +80 °CPP or PVDFFKM+5 to 90°CViscosityMax. 37mm²/sAmbient temperature. Voltages24V, 230V (further voltages on request)FrequencyAC/DCVoltage tolerance+/- 10%Duty cycle100%Electrical connection Coil insulation classMoulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuseProtection classIP65Coil insulation classH	for EPDM								
waste gases, oxygenfor FFKMAggressive mediums, hot air, hot oilsAll Materials - For more exact info. please refer to our chemical resistance chartMedium temperature for body materialNBR0 to +80 °CBrass or stainlessFKM0 to +90 °Cbrass or stainlessFKM0 to +90 °CSteelFFKM +5 to 90°CMedium temperature for body materialNBR0 to +80 °CPP or PVDFFKM0 to +80 °CFFKM+5 to 90°CMedium temperature for body materialKM0 to +80 °CPP or PVDFFKM0 to +80 °CFFKM+5 to +80°CViscosityMax. 37mm²/sAmbient temperature. Voltages24V, 230V (further voltages on request)FrequencyAC/DCVoltage tolerance+/- 10%Duty cycle100%Electrical connection Coll insulation classMoulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuseProtection classIP65		bleaching lyes							
for FFKMAggressive mediums, hot air, hot oilsAll Materials - For more exact info. please refer to our chemical resistance chartMedium temperature for body materialNBR0 to +80 °CBrass or stainlessFKM0 to +90 °CsteelFFKM +5 to 90°CMedium temperature for body materialNBR0 to +80 °CPP or PVDFFKM0 to +80 °CFFKM+5 to 90°CMedium temperature for body materialEPDM -30 to +80 °CPP or PVDFFKM0 to +80 °CFFKM+5 to +80°CViscosityMax. 37mm²/sAmbient temperature. Voltages24V, 230V (further voltages on request)FrequencyAC/DCVoltage tolerance+/- 10%Duty cycle100%Electrical connection ConnectionMoulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuseProtection classIP65Coil insulation classH	for FKM	Oxydizing acids and substances, hot oils with additives, salt solutions,							
All Materials - For more exact info. please refer to our chemical resistance chart         Medium temperature for body material       NBR       0 to +80 °C         brass or stainless       FKM       0 to +90 °C         steel       FFKM +5 to 90°C         Medium temperature for body material       EPDM -30 to +80 °C         Port Dody material       EPDM -30 to +80 °C         PP or PVDF       FKM       0 to +80 °C         FFKM +5 to 90°C       FKM 0 to +80 °C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. 455°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1)         Terminal box without safety fuse       Protection class         Protection class       H		waste gases, oxygen							
Medium temperature for body materialNBR0 to +80 °CEPDM-30 to +90 °Cbrass or stainlessFKM0 to +90 °CsteelFFKM+5 to 90°CMedium temperature for body materialEPDM-30 to +80 °CPP or PVDFFKM0 to +80 °CFFKM+5 to +80 °CViscosityMax. 37mm²/sAmbient temperature. Max. 455°CMax. 455°CVoltages24V, 230V (further voltages on request)FrequencyAC/DCVoltage tolerance+/- 10%Duty cycle100%Electrical connection Coil insulation classMoulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse	for FFKM	Aggressive mediums, hot air, hot oils							
for body material brass or stainlessEPDM -30 to +90°Cbrass or stainlessFKM 0 to +90 °CsteelFFKM +5 to 90°CMedium temperature for body materialNBR 0 to +80 °CPP or PVDFFKM 0 to +80 °CFFKM +5 to +80°CViscosityMax. 37mm²/sAmbient temperature. VoltagesMax. +55°CVoltage tolerance+/- 10%Duty cycle100%Electrical connection ACP016, chapter 7.6.1) Terminal box without safety fuseProtection classIP65Coil insulation classH	All Materials - For mor	e exact info. please refer to our chemical resistance chart							
brass or stainless steelFKM0 to +90 °CsteelFFKM+5 to 90°CMedium temperature for body material PP or PVDFNBR0 to +80 °CPP or PVDFFKM0 to +80 °CViscosityMax. 37mm²/sAmbient temperature. VoltagesMax. +55°CVoltages24V, 230V (further voltages on request)FrequencyAC/DCVoltage tolerance Duty cycle100%Electrical connection Coil insulation classMoulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse	Medium temperature	NBR 0 to +80 °C							
steel     FFKM     +5 to 90°C       Medium temperature for body material PP or PVDF     NBR     0 to +80 °C       FKM     0 to +80 °C       FFKM     +5 to +80°C       Viscosity     Max. 37mm²/s       Ambient temperature.     Max. +55°C       Voltages     24V, 230V (further voltages on request)       Frequency     AC/DC       Voltage tolerance     +/- 10%       Duty cycle     100%       Electrical connection     Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse       Protection class     IP65       Coil insulation class     H	for body material	EPDM -30 to +90°C							
Medium temperature for body material PP or PVDF       NBR       0 to +80 °C         FFKM       50 to +80 °C         FFKM       +5 to +80 °C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H	brass or stainless	FKM 0 to +90 °C							
for body material       EPDM -30 to +80°C         PP or PVDF       FKM 0 to +80°C         FFKM +5 to +80°C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H	steel	FFKM +5 to 90°C							
PP or PVDF       FKM 0 to +80 °C         FFKM +5 to +80°C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H	Medium temperature	NBR 0 to +80 °C							
FFKM       +5 to +80°C         Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H	for body material	EPDM -30 to +80°C							
Viscosity       Max. 37mm²/s         Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H	PP or PVDF	FKM 0 to +80 °C							
Ambient temperature.       Max. +55°C         Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H									
Voltages       24V, 230V (further voltages on request)         Frequency       AC/DC         Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse         Protection class       IP65         Coil insulation class       H	Viscosity	Max. 37mm²/s							
Frequency         AC/DC           Voltage tolerance         +/- 10%           Duty cycle         100%           Electrical connection         Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse           Protection class         IP65           Coil insulation class         H	Ambient temperature.	Max. +55°C							
Voltage tolerance       +/- 10%         Duty cycle       100%         Electrical connection       Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1)         Protection class       IP65         Coil insulation class       H	Voltages	24V, 230V (further voltages on request)							
Duty cycle         100%           Electrical connection         Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1) Terminal box without safety fuse           Protection class         IP65           Coil insulation class         H	Frequency	AC/DC							
Electrical connection         Moulded cable (For more detailed information, refer to the instruction manual ACP016, chapter 7.6.1)           Protection class         IP65           Coil insulation class         H	Voltage tolerance	+/- 10%							
ACP016, chapter 7.6.1)           Terminal box without safety fuse           Protection class         IP65           Coil insulation class         H	Duty cycle	100%							
Terminal box without safety fuse       Protection class     IP65       Coil insulation class     H	Electrical connection	Moulded cable (For more detailed information, refer to the instruction manual							
Protection class     IP65       Coil insulation class     H		ACP016, chapter 7.6.1)							
Coil insulation class H		Terminal box without safety fuse							
	Protection class	IP65							
	Coil insulation class	Н							
Type of protection II 2 G Ex mb IIC T4 Gb	Type of protection	II 2 G Ex mb IIC T4 Gb							
II 2 D EX mb IIIC T130° Db		II 2 D EX mb IIIC T130° Db							
Certificate EPS 16 ATEX 1 111 X	Certificate	EPS 16 ATEX 1 111 X							
IECEx EPS 16.0049X		IECEx EPS 16.0049X							
Installation As required, preferably with actuator upright	Installation	As required, preferably with actuator upright							

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#### Cycling rate

(B)

1 (P) 2(A)

T MA

1(P) 3(R)

2(B)

l**İ**thy

1(P) 3(R) 2(A)

-1h

W

1(P1) 3(P2) 4(A) 2(B)

> 1(P) 2(IN/OUT)

ılı∿w

 $\Box$ 

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- )												
	Max. cycling rate	For mediums temp	For ambient temp.									
Variant 1	20/min	Up to +70 °C	Up to +40 °C									
Variant 2	5/min	Up to +90 °C	Up to +40 °C									

## Power consumption

Inrush [W]	Operation [W]
40	3

#### **Response times**

Orifice [mm]	Opening [ms]	Closing [ms]
2 - 4	30	40

## Response times [ms]:

Measured at valve outlet at 6 bar and +20 °C *Opening*: Pressure rise 0 to 90%,

Closing: Pressure drop 100 to 10%



# Technical data (continued)

# Pressure range and flow rate for metal body

Circuit function	DN	Kv value water [m³/h]	Standard Pressure range <sup>2) 3)</sup> [bar]	Vacuum Pressure range [bar]
A/B/C/D/F	2.0	0.11	0 - 16	-0.98 – 10
	3.0	0.18	0 - 10	-0.98 - 6
	4.0	0.23	0 – 5	-0.98 – 3
	5.0	0.29	0 - 4	-0.98 - 2.5
E	2.0	0.11	0 - 10	-0.98 - 8
	3.0	0.18	0 - 6	-0.98 – 5
	4.0	0.23	0 – 3.5	-0.98 - 2.5
	5.0	0.29	0 - 3	-0.98 - 2
Т	2.0	0.11	0 - 10	-0.98 - 8
	3.0	0.18	0 - 6	-0.98 – 5

## Pressure range and flow rate for plastic body

Circuit function	DN	Kv value water [m³/h]	Standard Pressure range <sup>2) 3)</sup> [bar]	Vacuum Pressure range [bar]
A/B/C/D/F	2.0	0.13	0 - 16	-0.98 – 10
	3.0	0.25	0 - 10	-0.98 - 6
	4.0	0.30	0 – 5	-0.98 – 3
	5.0	0.40	0 - 4.5	-0.98 – 1
E/T	2.0	0.13	0 - 10	-0.98 - 7
	3.0	0.25	0 - 6	-0.98 – 5
	4.0	0.30	0 – 3	-0.98 – 2.5

 $^{\scriptscriptstyle ()}$  Measured at +20 °C, 1 bar^{\scriptscriptstyle 2)} pressure at valve inlet and free outlet.

<sup>2)</sup> Devices with FKM or FFKM diaphragm are reduced to a max. pressure of 12 bar <sup>3)</sup> Pressure data [bar]: Measured as overpressure to the atmospheric pressure



## Other circuit functions

The valves are fitted with different springs for a specific circuit function. When used in other circuit functions the permissable operating pressure changes acc. to the following table.

Metal body	letal body																	
Valve																		
operation	Orifice 2mm Orifice 3mm Orifice 4mm																	
	A1)	<b>B</b> <sup>1)</sup>	С	D	E	F	Α	В	С	D	E	F	Α	В	С	D	E	F
С	16	1.5	16	1.5	1.5	16	10	1	10	1	1	10	5	0.8	5	0.8	0.8	5
D	4	16	4.5	16	4	4	2.5	10	2.5	10	2	3	2	5	2	5	2	2
Т	8	8	10	10	10	8	6	6	6	6	6	6	3	3	3	3	3	3

# Plastic body

Flastic bo	riasii buuy																	
Valve	Max. operating pressure [bar] when using the valve in a new circuit function																	
operation	Orifice 2mm Orifice 3mm Orifice 4mm																	
	<b>A</b> <sup>1)</sup>	<b>B</b> 1)	С	D	E	F	Α	В	С	D	E	F	Α	В	С	D	E	F
С	16	1.5	16	1.5	1.5	16	10	1	10	1	1	10	5	0.8	5	0.8	0.8	5
D	4	16	4.5	16	4	4	2.5	10	2.5	10	2	3	2	5	2	5	2	2
F	16	1.5	10	1.5	1.5	16	6	1	6	1	1	10	4	1	4	1	1	

<sup>1)</sup> For circuit function A and B the valve must be connected acc. to the pin assignment of 3/2-way valve.

# Additional options

Option	Variable	Description
	Code	
Oxygen versions	NL02	Suitable for applications with oxygen
		(non-metal materials that are in contact with the medium, are tested and
		approved according to BAM)
Increased purity requirements e.g. oil, grease and	NL50/NL05	Wetted parts are specially cleaned and packaged in accordance with the
silicone-free		valves
Increased hermetic requirements	PCxx	Standard units are tested at 10 <sup>-2</sup> mbar x I / sec; feasable up to 10 <sup>-6</sup> mbar
Vacuum version	NA02	Suitable for vacuums up to -0.98bar
Increased purity and hermetic requirements	NA03	Wetted parts are specially cleaned and leak tested to 10 <sup>-4</sup> mbar x l/sec
Increased purity and hermetic requirements and vacu-	NA01	Wetted parts are specially cleaned and leak tested up to 10 <sup>-4</sup> mbar x l/sec
um version		and suited for vacuum up to -0.98 bar
Electrical feedback	CF15	Coil with intrinsically safe proximity switches (PTB 00 ATEX 2048X)
		instead of manual override



# **Dimensions** [mm]





## **Port connections**

The connections marked with 1, 2 and 3 are labelled in the drawing according to the circuit function table on the left.

Circuit function	Connection 1	Connection 2	Connection 3
А	Р	A	
В	В	Р	
С	Р	A	R
D	R	В	Р
E	P1	A	P2
F	Α	Р	В



# Ordering chart

5 L	[m m]			_ u		er voltage/ cy [V/Hz]
Circuit func- tion	Orifice [r	Seal Material	Housing or seat material	Electrical connection	024/UC	230/UC
A <sup>2)</sup>	3.0	NBR	MS	Terminal box	306 165	306 167
	3.0	NBR	MS	cable	306 005	306 006
	3.0	FKM	Stainless steel	Terminal box	306 168	306 169
	3.0	FKM	Stainless steel	cable	306 007	306 008
С	3.0	NBR	MS	Terminal box	304 531	306 149
	3.0	NBR	MS	cable	305 982	305 985
	3.0	FKM	Stainless steel	Terminal box	306 154	306 164
	3.0	FKM	Stainless steel	cable	306 003	306 004
E	3.0	FKM	Stainless steel	Terminal box	306 171	306 157
	3.0	FKM	Stainless steel	cable	306 009	306 010
F	3.0	FKM	Stainless steel	Terminal box	306 198	306 172
	3.0	FKM	Stainless steel	cable	306 011	306 012
Т	4.0	FKM	Stainless steel	Terminal box	306 151	-
	4.0	FKM	Stainless steel	cable	306 050	-

Note: Further versions on request



#### **Ex-Cable glands**

(polyamide version included in delivery / surcharge applied for brass nickel plated version

	Ex Approvals				
Photo	Description	Certification	Identifica- tion	ltem no	Drawing
	Brass. nickelpla- ted, 6-13 mm	PTB 04 ATEX 1112 X, IECEx PTB 13.0027X	ll 2 G Ex e IIC Gb, Il 2 D Ex tb IIIC Db IP68,	773 278	SW/E         TL         29-37 mm           L         6 mm         D         20           SW         24 mm         E         27 mm
	Polyamide, 7-13 mm	PTB 13 ATEX 1015 X, IECEx PTB 13.0034X	II 2 G Ex e IIC Gb, II 2 D Ex tb IIIC Db IP68	773 277	SW/E         TL         36-45 mm           L         10 mm           D         20           SW         24 mm           E         28 mm

## Special tool to turn the junction box (not included in delivery)

Photo	Descrip- tion	ltem no.
- 5Nm SW19	Set SC02-AC10 Special wrench Service Manual	293 488

To find your nearest Bürkert facility, click on the orange box  $\; 
ightarrow$ 

www.burkert.com

In case of special application conditions, please consult for advice.

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