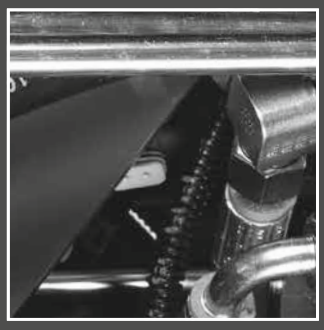
CLAAS
INDUSTRIETECHNIK

Hydraulics

Product Catalogue

Valve series

CL02



Contents

CLAAS INDUSTRIETECHNIK

At home in every field – system solutions from CLAAS Industrietechnik

CLAAS Industrietechnik is your innovative, reliable partner for the development and supply of hydraulic components and drive technology systems. Our strengths: our 600 employees in Paderborn, Germany develop and produce specific solutions tailored to the needs of customers and industries. Hence you will find our products and systems in agricultural and construction machinery, in municipal service technology and a wide range of special applications. Our customers appreciate the high-level product benefits and top-class technology we offer. As different as the customer-specific applications are our products always share the same strengths: innovation, reliability and quality to meet the highest requirements.

Modular efficiency: hydraulic valves from CLAAS Industrietechnik

High-quality switching and proportional valve technology is one of the core competences of CLAAS Industrietechnik. Our system approach includes the whole range from design and simulation to integration in our customers' applications. Herewith we develop solutions for a wide variety of challenges in hydraulic and electronic system technology.

Our test facilities are used to validate all components and systems thoroughly during the development process. Our switching valves, directional valves, pressure and flow control valves are used as basic components. At the start of a development project, our engineers try to get a complete understanding of the application together with our customers. After this, they develop individual solutions on the basis of our modular philosophy. The wide range of combination options available with the basic elements of our modular mobile hydraulic system is adapted to your application in a technically and economically efficient way. With it we offer a holistic project handling for all hydraulic tasks.

Combination of hydraulics and electronics

Solving complex control tasks demands a close interaction of hydraulics and electronics. The combination of the modular mobile hydraulic system and our electronic control systems developed and tested in our own company provides the basis for customized solutions that are precisely tailored to your needs.

Overview of the CL02 valve series

The CL02 valve series combines an effective monoblock design with flexible section design. Basic blocks in a monoblock design can be specially designed for each machine, or it is possible to make use of standard valve blocks from the CIT modular system. Each basic block can be enhanced by valve sections in order to respond to customer requirements flexibly and effectively.

Thanks to the „screw-in-screw system“ which was developed especially for this series, the end sections and studs, which will be familiar to you from the conventional section design, are not required in the CL02 series. Instead, depending on demand, it is possible to connect up to four individual valve sections or additional functions on the basic block.
In addition, apart from the relevant valve sections, only a connection set consisting of O-rings and four special screws is required. Customer-specific equipment requirements can therefore still be fulfilled during final vehicle assembly.

The main elements of the CL02 series are leak-proof poppet valves in a cartridge design. Depending on the application, 3/2 directional cartridges with positive or negative overlap can be selected. In addition, a wide selection of different seat and shaft diameters are available, which can be used to adapt the control systems for pressure and flow to the requirements of their respective application. The series is completed by different check, pressure and flow valves.

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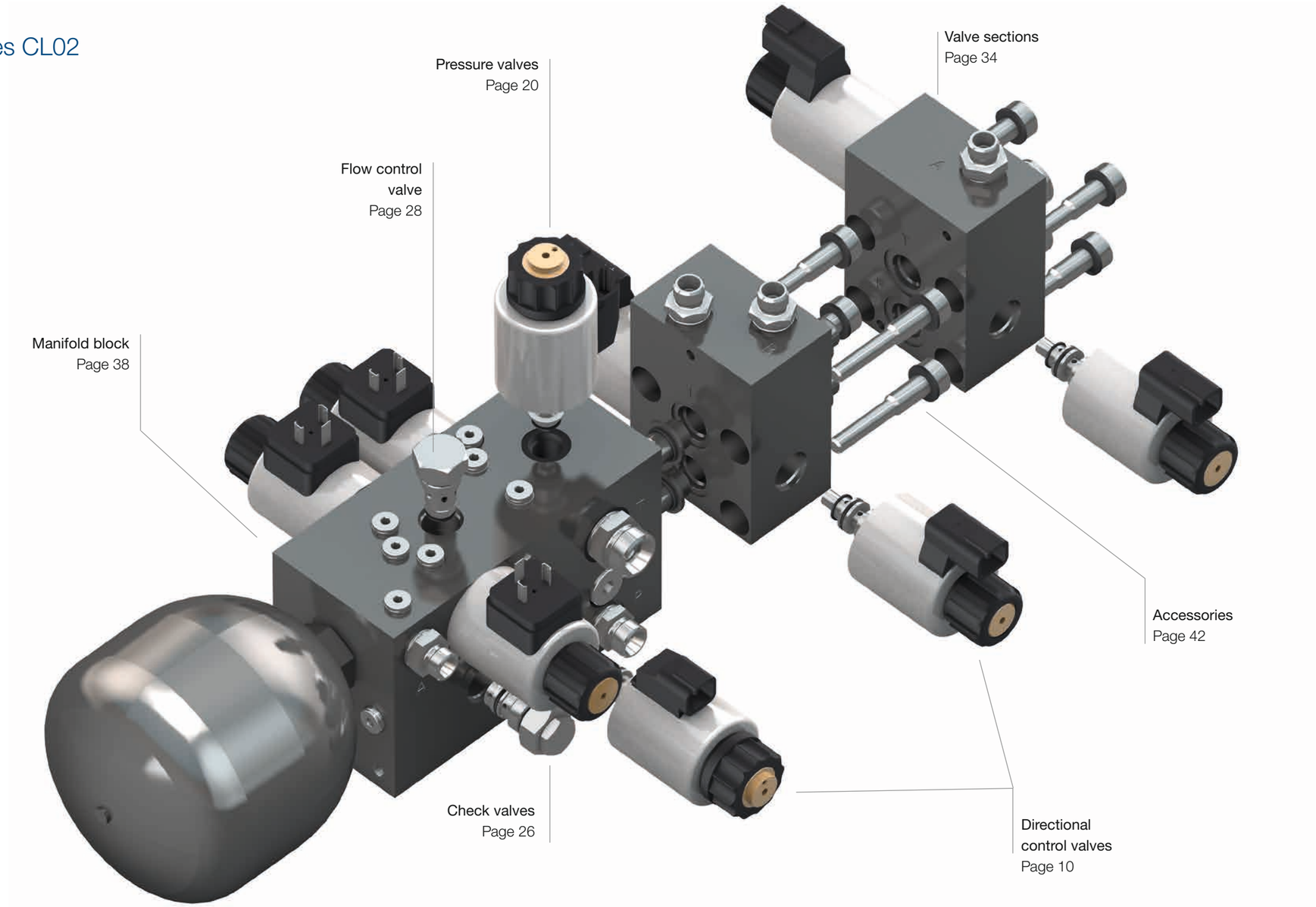
Components of valve series CL02



General technical data

Inlet pressure	max.	210 bar
Outlet pressure	max.	210 bar
Back pressure at T	max.	210 bar
Ambient temperature	min.	-25° C
	max.	+50° C
Permissible oil temperature	min.	-25° C
	max.	+85° C
Permissible oil viscosity	min.	10 cSt
	max.	500 cSt
	optimal	35 cSt

Permissible oil types		Mineral oil HL, HLP, HVLP according to DIN 51524;
		polialphaolefines, e.g. Avia Syntofluid;
		other fluids on request
Oil cleaniness	min.	21/18/15 according to ISO4406; no particles >200 µm
Nominal voltage		12 VDC and 24 VDC
Electric connectors	Standard	Compagnie Deutsch DT04-2P IPX9K
	Optional	3-pin DIN connector accordinbg to DIN EN175301-803 (IP65)
	Optional	AMP Junior Timer 2-pin (IP65)
Electrical protection class		IP65 to 69 according to EN 60529, depending on the connector
		Only applies in conjunction with a fitted connector

Screw-in cartridges of the CL02 valve series

CL02 cartridges
The CL02 modular system is based on 2/2 and 3/2 directional poppet valves for an operating pressure of up to 210 bar and a nominal flow rate of 10 l/min. All valves have spherical seats to ensure leak-proof operation and are especially robust thanks to direct electrical operation. An axial elastomer-coated aluminium disc and a radial O-ring are used to guarantee optimal leak-tightness in the valve housing. Furthermore, the high demands of mobile equipment with regards to temperature, vibrations, dirt and moisture are fulfilled.

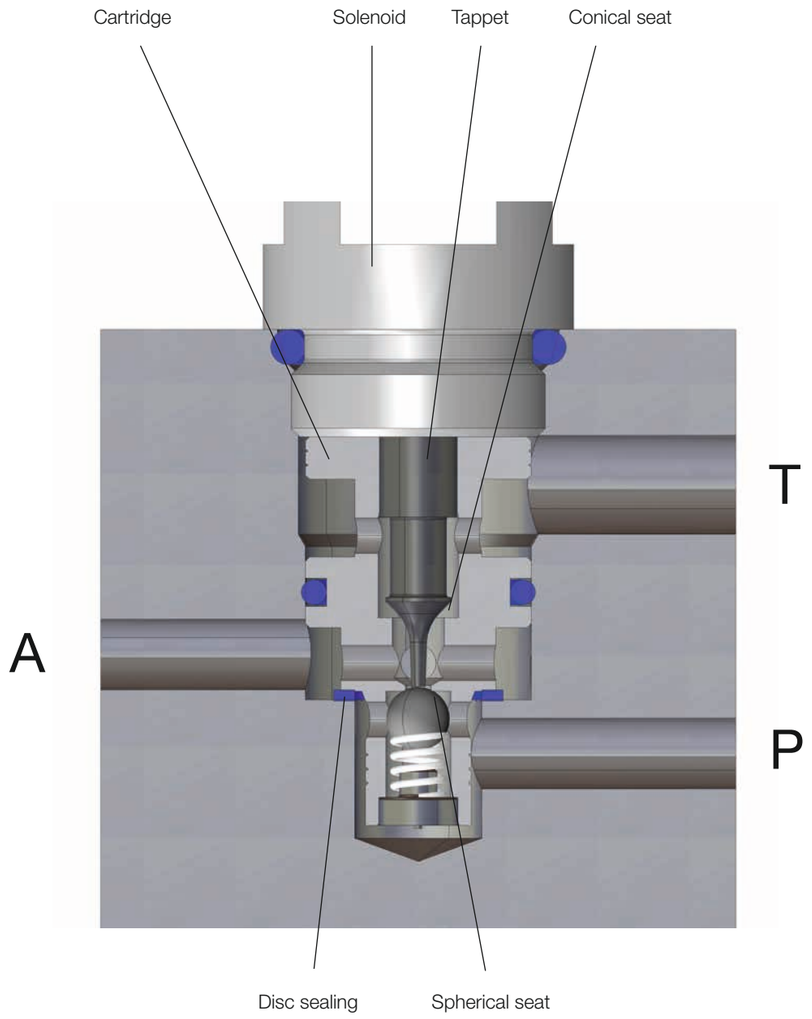
Using the combination of different conical seat and spherical seat diameters, an extremely wide range of flow rates can be achieved. The schematic diagram opposite shows an example of the structure of a 3/2 directional cartridge. The cavity always remains the same in the different categories meaning that it is possible to replace the valves later.

Directional control valves Page 10
Compact poppet valves in both 2/2 directional and 3/2 directional versions – with negative or positive overlap – are the essential functional elements of the series. The wide variety of size categories available enables the customer requirements to be complied with exactly.

Pressure valves Page 20
Pressure relief valves and mechanical/electrical proportional pressure reducing valves for different pressure ranges are also included in the series.

Check valves Page 26
Check valves with plastic sealing seats for complete leak-tightness and axial pipe connection, or alternatively, radial connection, round off the range of standard components for the CL02 series.

Flow control valves Page 28
Flow controllers are available in seven size categories, complemented by a space-saving plug-in design, for assembly in channel P between two valve sections.



P = Pressure supply
T = Tank connection
A = Actuator connection

Valve sections in the CL02 valve series

The aluminium valve sections of the CL02 series are designed for 4/3 directional, 4/3 directional with piloted double check valve and 3/3 directional standard functions at operating pressures up to 210 bar. They can be combined with customer-specific valve blocks using the CLAAS-specific so-called „screw-in-screw“ principle. In addition, standard basic blocks are available which already combine various valve functions, resulting in a modular valve system. With special basic blocks, machine-specific functions can be covered, e.g. pressure relief valves, pressure switches, check valves, hydraulic accumulators or flow control valves. Hydraulic blocks can therefore be easily adapted to individual requirements with regard to switching characteristics and nominal flow rate.

Note:
In order to respond to the different requirements of our customers, the categories in the CL02 series (spherical seat and conical seat diameters) are selected extremely carefully, so that there is a wide variety of combinations and variants. For this reason, the standard valve sections in the series do not have a separate order code. However, it is possible to combine all directional valve cartridges. Simply contact us and we will put together an individual valve section.

3/2 directional poppet valve

Positive overlapped

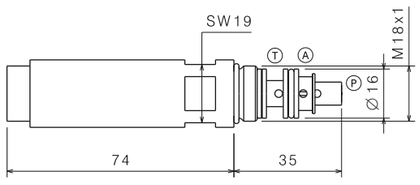
The high-performance 3/2 directional poppet valves have hardened tappets and balls. All external parts have a Cr VI-free zinc coating for protection against environmental impact and they are thus also suitable for use under extremely rough conditions. The positive overlapped design is particularly suitable for switching operations, in which a loss of oil is not desired, for example, for pressure supply using a hydraulic accumulator.

Technical Data

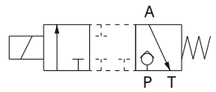
Model	3/2 directional valve, poppet type	
Installation position	Any	
Cavity	CL02	
Weight (excluding coil)	0,23 kg	
Nominal flow rate*	10 l/min	
Switching time	< 130ms	
Switching frequency	Max. 5000/h	
Leckage*	Max. 3 drops/min. at ΔP 10 – 210 bar	
Nominal voltage	12 VDC; 24 VDC	
Supply voltage tolerance	±10 %	
Duty cycle	60 %; 100 %	
Nominal power consumption (20°C)	Max. 46 W	
Nominal current (operating temp.)	60% and 12VDC: 3,8 A	24VDC: 1,9 A
	100% and 12VDC: 2,6 A	24VDC: 1,3 A
Coil type	CS02-MSP-045-SW0-_____	
Standard electrical connection	Deutsch DT04-2P with freewheeling diode	
Coil diameter	45 mm	

* Data and characteristic curves measured with oil viscosity approx. 35cSt

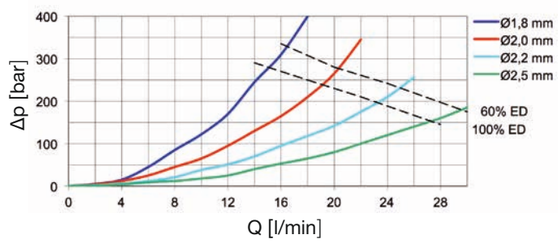
Dimensional drawing



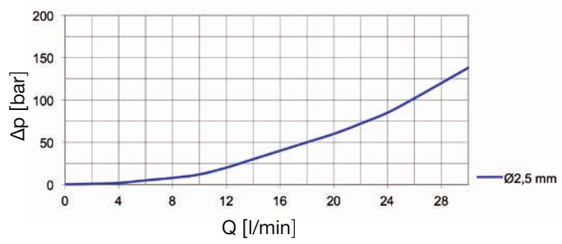
Characteristic curves



Flow resistance (P-A)



Flow resistance (A-T)



Order code

	CC02	-	W32	-	PP0	-	STN	-		-	25	-		-	
Series	CLAAS cartridge range CL02														
Type			3/2 directional valve												
Model					PP0										
Version							STN								
Spherical seat diameter at P									18						
									20						
									22						
									25						
Tappet diameter											25				
Nominal voltage and duty cycle													126		
													246		
													121		
													241		
													OSP		
Connector type															DIN
															DTD
															AMP
															000

3/2 directional poppet valve

Negative overlapped

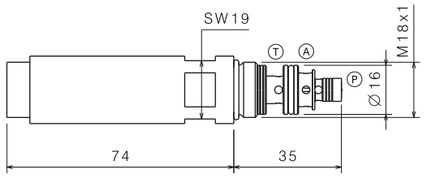
The versatile 3/2 directional poppet valves have hardened tappets and balls. All external parts here also have a Cr VI-free zinc coating in order to protect the valve against corrosion. The negative overlap is characterised by smooth switching operations. This results in a slow and limited build-up of pressure in the actuator. In addition to the simple directional valve function, the negative overlapped valve also works as a maximum pressure relief valve in actuator connection A. This opening pressure can be varied by choosing different conical seat diameters.

Technical Data

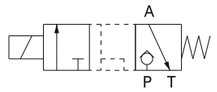
Model	3/2 directional valve, poppet type	
Installation position	Any	
Cavity	CL02	
Weight (excluding coil)	0,24 kg	
Nominal flow rate*	10 l/min	
Switching time	< 130 ms	
Switching frequency	Max. 5000/h	
Leckage*	Max. 3 drops/min. at ΔP 10 – 210 bar	
Nominal voltage	12 VDC; 24 VDC	
Supply voltage tolerance	±10 %	
Duty cycle	60 %; 100 %	
Nominal power consumption (20°C)	Max. 46 W	
Nominal current (operating temp.)	60% and 12VDC: 3,8 A	24VDC: 1,9 A
	100% and 12VDC: 2,6 A	24VDC: 1,3 A
Coil type	CS02-MSP-045-SW0-______	
Standard electrical connection	Deutsch DT04-2P with freewheeling diode	
Coil diameter	45 mm	

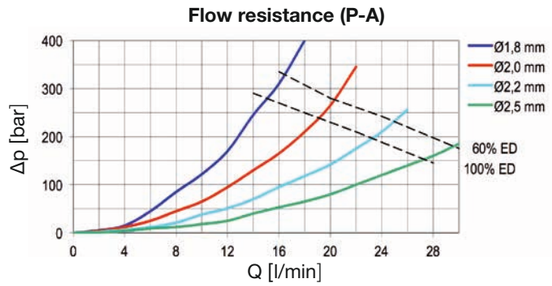
* Data and characteristic curves measured with oil viscosity approx. 35cSt

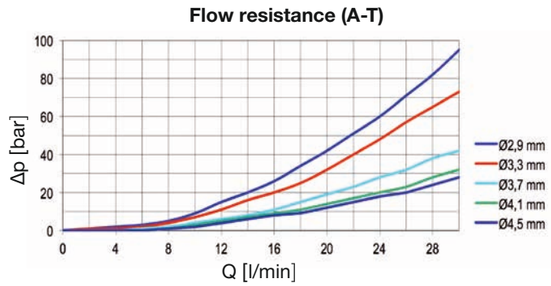
Dimensional drawing



Characteristic curves







Order code

CC02 - W32 - NP0 - STN - ☐ - ☐ - ☐ - ☐

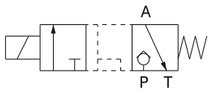
Series	CLAAS cartridge range CL02	
Type	3/2 directional valve	
Model	poppet type with negative overlap	NP0
Version	Solenoid, standard version with manual override	STN
Spherical seat diameter at P	1,8 mm	18
	2,0 mm	20
	2,2 mm	22
	2,5 mm	25
Conical seat diameter at T	2,9 mm	29
	3,3 mm	33
	3,7 mm	37
	4,1 mm	41
	4,5 mm	45
Nominal voltage and duty cycle	12 V 60 %	126
	24 V 60 %	246
	12 V 100 %	121
	24 V 100 %	241
	no coil	OSP
Connector type	DIN 43650	DIN
	DT04-2P with freewheeling diode	DTD
	AMP-Junior-Timer	AMP
	no coil	000

Screw-in Cartridges

3/2 directional poppet valve

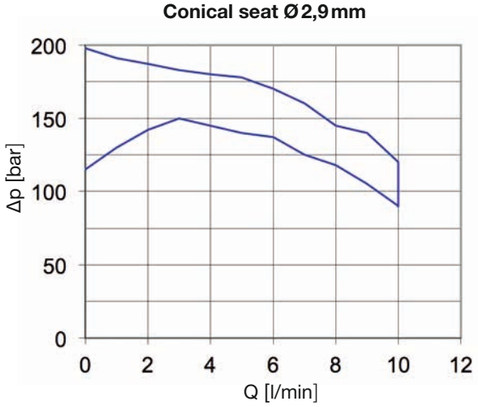
Negative overlapped – pressure relief valve function

Characteristic curves

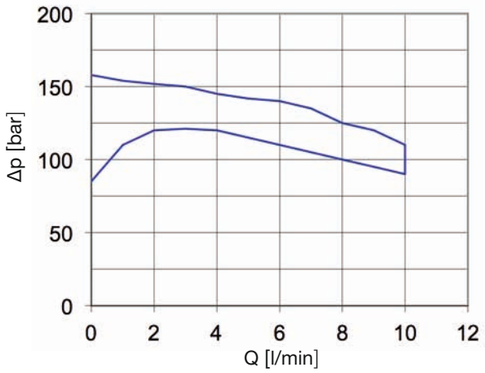


The conical seat and the magnetic force create the pressure relief valve function. The pressures displayed are to be taken as examples because the values vary significantly depending on the flow rate and the temperature of the magnet. Before planning a control system, the pressure relief valve function must be checked extremely carefully and we recommend a operation in combination with a flow control valve.

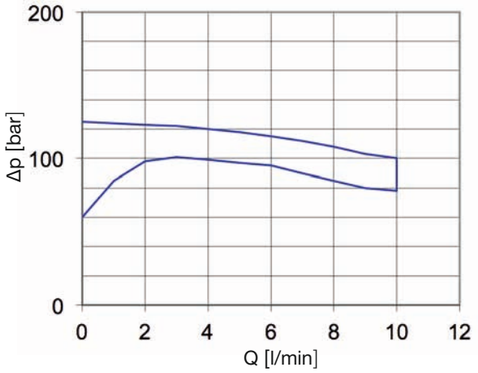
Conical seat Ø 2,9 mm



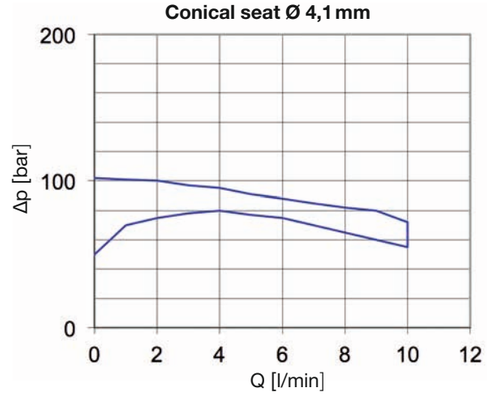
Conical seat Ø 3,3 mm



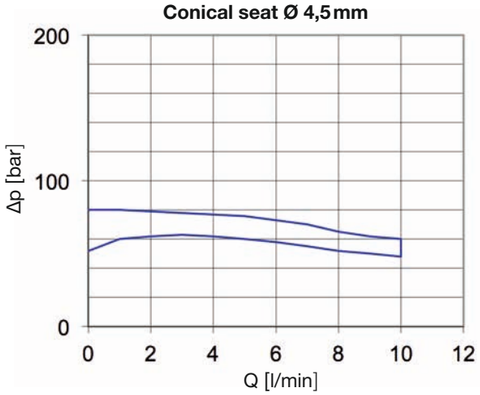
Conical seat Ø 3,7 mm



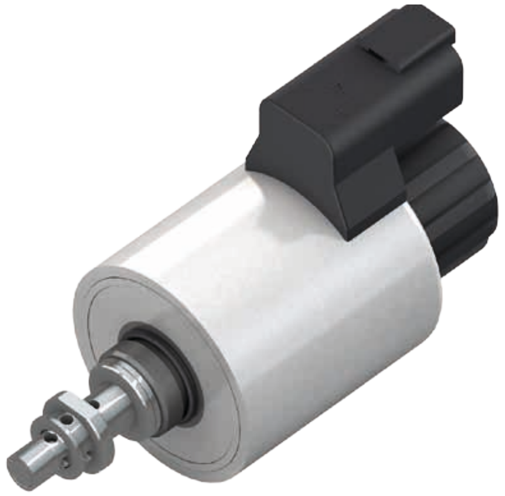
Conical seat Ø 4,1 mm



Conical seat Ø 4,5 mm



2/2 directional poppet valve



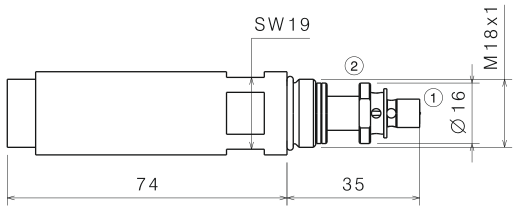
The 2/2 directional poppet valves also have hardened pistons and balls. However, in contrast to the 3/2 directional valve cartridge, they do not have a seal between „A“ and „T“. This creates a connection from „P“ to „A“ and „T“ in the switched state. Here, the conical seat is only used as a tappet stop. The characteristic curve (1-2) acts in the same way as that of the 3/2 directional valve insert (P-A) due to them having the same spherical seat geometry.

Technical Data

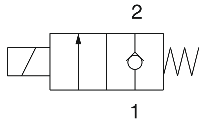
Model	2/2 directional valve, poppet type	
Installation position	Any	
Cavity	CL02	
Weight (excluding coil)	0,22 kg	
Nominal flow rate*	10 l/min	
Switching time	< 130 ms	
Switching frequency	Max. 5000/h	
Leckage*	Max. 3 drops/min. at ΔP 10 – 210 bar	
Nominal voltage	12 VDC; 24 VDC	
Supply voltage tolerance	±10 %	
Duty cycle	60 %; 100 %	
Nominal power consumption (20°C)	Max. 46 W	
Nominal current (operating temp.)	60% and 12VDC: 3,8 A	24VDC: 1,9 A
	100% and 12VDC: 2,6 A	24VDC: 1,3 A
Coil type	CS04-MSP-045-SW0-______	
Standard electrical connection	Deutsch DT04-2P with freewheeling diode	
Coil diameter	45 mm	

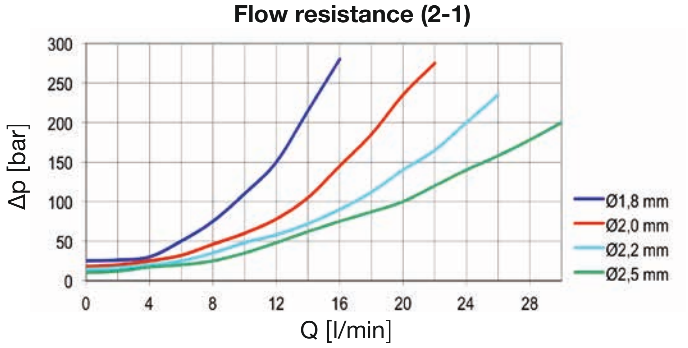
* Data and characteristic curves measured with oil viscosity approx. 35cSt

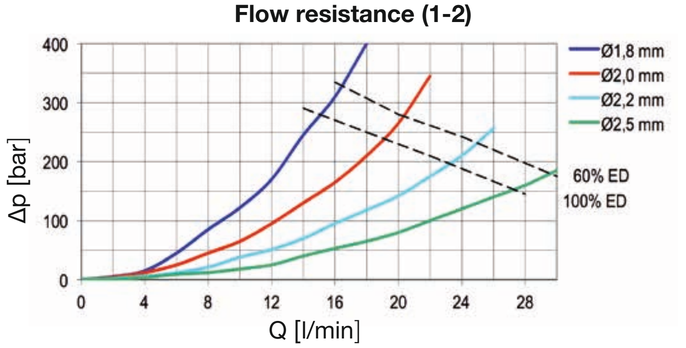
Dimensional drawing



Characteristic curves







Order code

Order code	CC02 - W22 - BSV - STN - ☐ - ☐ - ☐ - ☐	
Series	CLAAS cartridge range CL02	
Type	2/2 directional valve	
Model	poppet type	BSV
Version	Solenoid, standard version with manual override	STN
Spherical seat diameter at 1	1,8 mm	18
	2,0 mm	20
	2,2 mm	22
	2,5 mm	25
Conical seat diameter at 2	4,1 mm	41
Nominal voltage and duty cycle	12 V 60 %	126
	24 V 60 %	246
	12 V 100 %	121
	24 V 100 %	241
	no coil	OSP
Connector type	DIN 43650	DIN
	DT04-2P with freewheeling diode	DTD
	AMP-Junior-Timer	AMP
	no coil	000

2/2 directional poppet valve

With plastic sealing seat

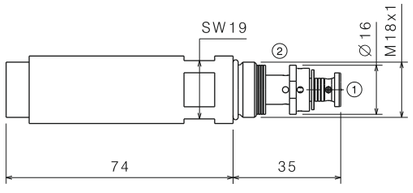
In this version, the 2/2 directional cartridge has a fibre-reinforced plastic spherical seat, so that absolute leak-tightness can be guaranteed. As this valve is generally only used as an electrically unlockable check valve, the conical seat, which only serves as a tappet stop in this function, is only available with a diameter of 3.3 mm. The flow values and switching times show virtually no deviations from the standard variants. A diameter of 1.8 mm is usually used for the seat diameter, meaning that the flow rate is limited to a maximum of 5 l/min, due to the design.

Technical Data

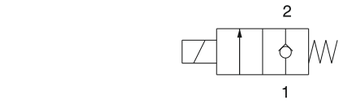
Model	2/2 directional valve, poppet type	
Installation position	Any	
Cavity	CL02	
Weight (excluding coil)	0,21 kg	
Nominal flow rate*	5 l/min	
Switching time	130 ms	
Switching frequency	Max. 5000/h	
Leckage*	Max. 1 drops/min. at ΔP 10 – 210 bar	
Nominal voltage	12 VDC; 24 VDC	
Supply voltage tolerance	±10 %	
Duty cycle	60 %; 100 %	
Nominal power consumption (20°C)	Max. 46 W	
Nominal current (operating temp.)	60% and 12VDC: 3,8 A	24VDC: 1,9 A
	100% and 12VDC: 2,6 A	24VDC: 1,3 A
Coil type	CS04-MSP-045-SW0-_____	
Standard electrical connection	Deutsch DT04-2P with freewheeling diode	
Coil diameter	45 mm	

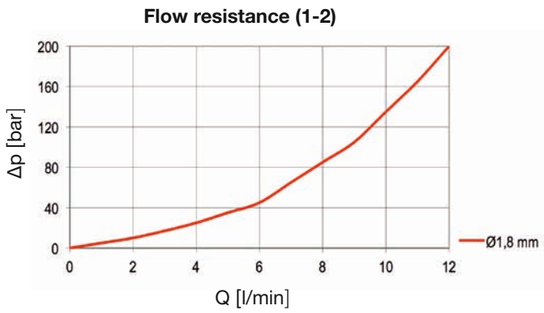
* Data and characteristic curves measured with oil viscosity approx. 35cSt

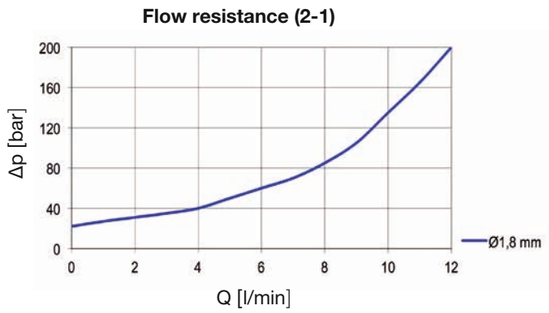
Dimensional drawing



Characteristic curves







Order code

CC02 - W22 - BSV - STN - ____ - ____ - ____ - ____

Series	CLAAS cartridge range CL02	
Type	2/2 directional valve	
Model	poppet type	BSV
Version	Solenoid, standard version with manual override, sealing seat	STN
Spherical seat diameter	1,8 mm	18
	2,2 mm	22
Conical seat diameter	3,3 mm	33
Nominal voltage and duty cycle	12 V 60 %	126
	24 V 60 %	246
	12 V 100 %	121
	24 V 100 %	241
	no coil	OSP
Connector type	DIN 43650	DIN
	DT04-2P with freewheeling diode	DTD
	AMP-Junior-Timer	AMP
	no coil	000

Pressure relief valve

Mechanical

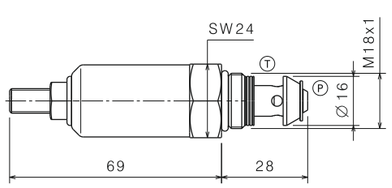
The pressure relief valves in the CL02 series can be used for flow rates up to 20 l/min. The spring-loaded and hardened piston runs in the sleeve with low friction. Thanks to the six different seat diameters, pressure ranges between 15 bar and 300 bar can be covered.
By default, the valves are set to the pressure that is required by the customer and they are checked to ensure that they function correctly and that they are leak-tight. All external parts have a CrVI-free zinc coating.

Technical Data

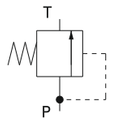
Model	Pressure relief valve, spring loaded, poppet type
Installation position	Preferably suspended
Cavity	CL02-DBV
Weight (excluding coil)	0,19 kg
Nominal flow rate	10 l/min
Flow rate	Max. 20 l/min
Adjustable nominal pressure*	Min. 20 bar (10 l/min) Max. 300 bar (10 l/min)
Leckage*	Max. 3 drops/min. at 70% preset pressure

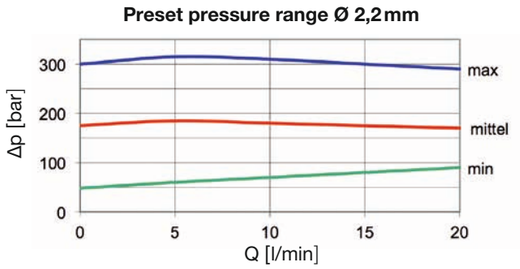
* Data and characteristic curves measured with oil viscosity approx. 35cSt

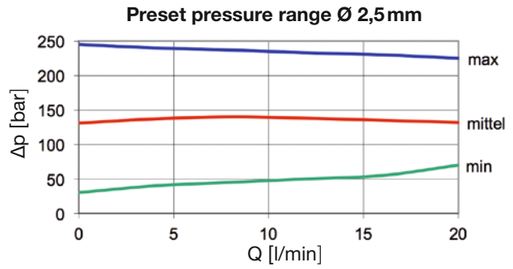
Dimensional drawing

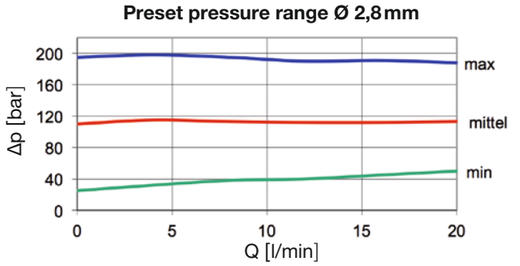


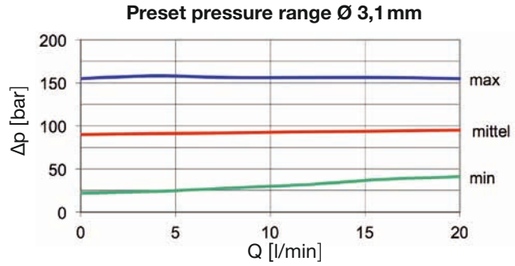
Characteristic curves

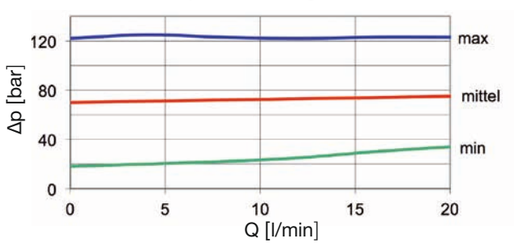


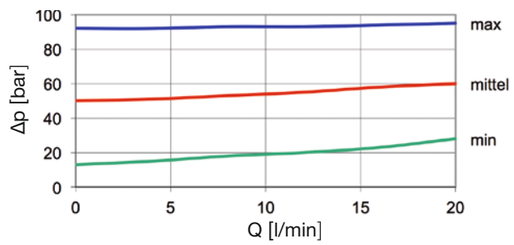








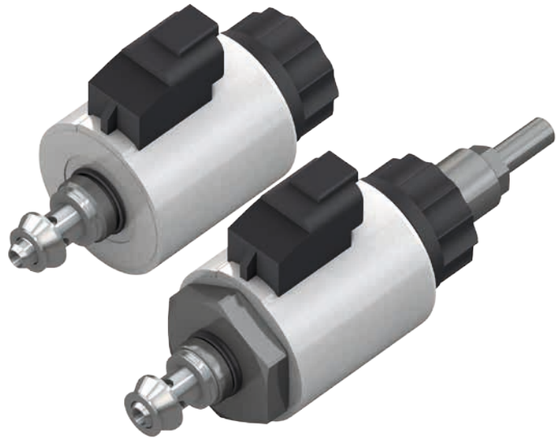




Pressure relief valve
Mechanical

Order code	CC02	-	DBV	- ME0	-	-	41
Series	CLAAS cartridge range CL02						
Type	Pressure relief valve, poppet type		DBV				
Version	mechanical, adjustable			ME0			
Preset pressure	depending on the pressure range xxx bar				XXX		
Seat diameter (pressure range)	2,2 mm (50 bar – 300 bar)					22	
	2,5 mm (40 bar – 250 bar)					25	
	2,8 mm (30 bar – 200 bar)					28	
	3,1 mm (25 bar – 160 bar)					31	
	3,5 mm (20 bar – 120 bar)					35	
	4,0 mm (15 bar – 90 bar)					40	
Tappet diameter	4,1 mm						41

Pressure relief valve
Electrical



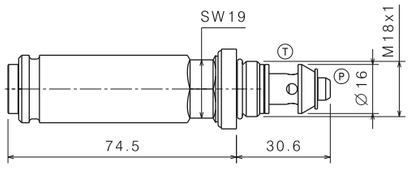
The same valve elements are used for the electrically proportional pressure relief valves as for the mechanical variants. Six pressure ranges can also be achieved here thanks to the different seat diameters. Using the proportional magnets, a pressure range from 0 – 250 bar can be covered. The inversely proportional magnet can be used up to a maximum of 210 bar. The CrVI-free zinc coated tubular frames have a venting screw for problem-free initial operation.

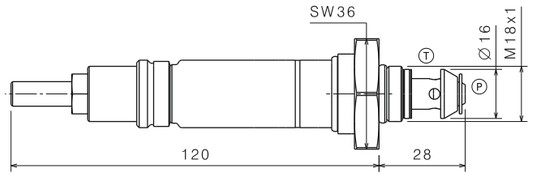
Technical Data

Model	Pressure relief valve, electric, poppet type, proportional/inverse
Installation position	Preferably suspended
Cavity	CL02-DBV
Weight (excluding coil)	Invers-prop: 0,35 kg / prop: 0,22 kg
Nominal flow rate	5 l/min
Adjustable nominal pressure*	Inverse prop.: 0-225bar pressure decrease electric proportional Prop.: 0-210bar electric proportional
Leckage*	Max. 3 drops/min. at 70% pre-set pressure
Nominal voltage	12 VDC; 24 VDC
Supply voltage tolerance	±10 %
Duty cycle	100 %
Nominal power consumption (20°C)	Max. 46 W
Nominal current (operating temp.)	12VDC: 0–1,9 A / bei 24VDC: 0–1,0 A
Electrical resistance	20° C 12VDC: 4,55 Ω 24VDC: 17,6 Ω
Optimum PWM frequency *	200 Hz
Coil type	CC02-MSP-045-PR0
Standard electrical connection	Deutsch DT04-2P
Coil diameter	45 mm

* Data and characteristic curves measured with oil viscosity approx. 35cSt

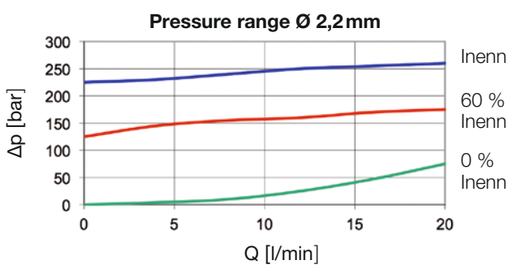
Dimensional drawing

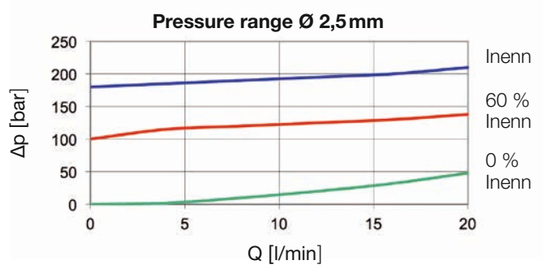


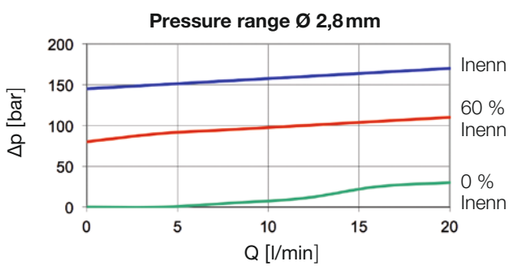


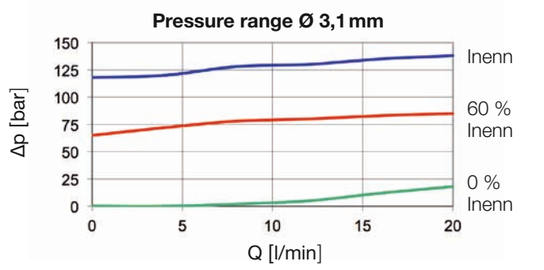
Pressure relief valve
Electrical

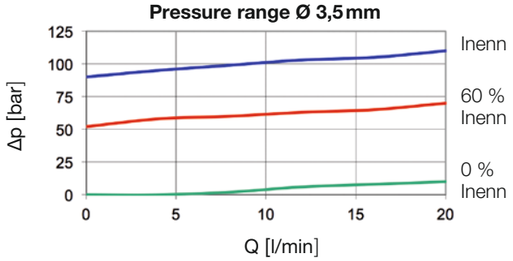
Characteristic curves

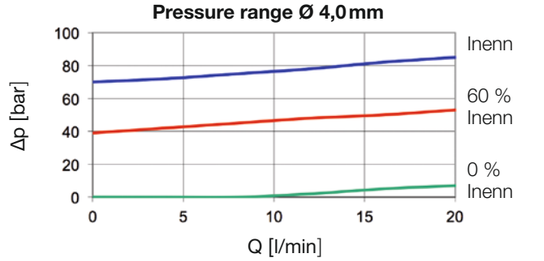








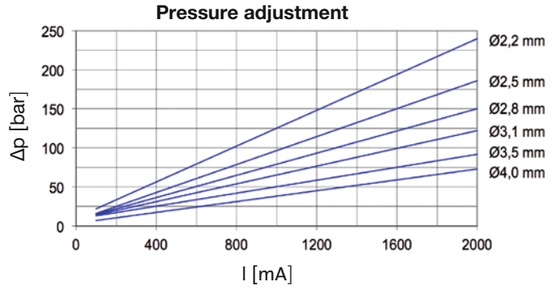


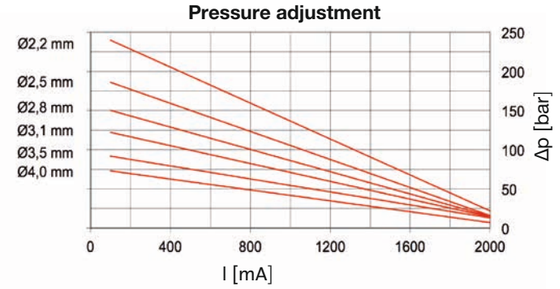


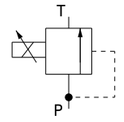
Note:
The working areas of the inversely proportional pressure relief valves are not shown. In terms of their PQ characteristics, they behave exactly as shown above. The correlation between the set pressure and the current is inverse. Both variants cover the same working areas with the same seat diameters.
With inversely proportional valves, the maximum pressure can be adjusted even more precisely using a screw. Specify the desired value in the order code under „Preset pressure“. The proportional variants do not have this adjustment option.

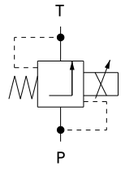
Pressure relief valve
Electrical

Characteristic curves (continuation)







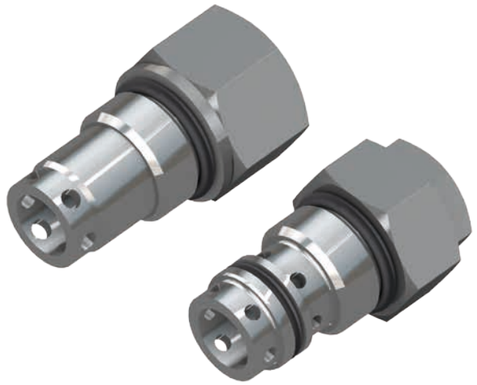


Order code CC02 - DBV - ____ - ____ - ____ - 41 - ____ - ____

Series	CLAAS cartridge range CL02									
Type	Pressure relief valve, poppet type	DBV								
Version	Electric proportional		E00							
	Electric invers proportional		I00							
Preset pressure	depending on the pressure range xxx bar (inverse)			XXX						
	for electric proportional			000						
Seat diameter (pressure range)	2,2 mm (0 bar – 225 bar)				22					
	2,5 mm (0 bar – 180 bar)				25					
	2,8 mm (0 bar – 150 bar)				28					
	3,1 mm (0 bar – 120 bar)				31					
	3,5 mm (0 bar – 90 bar)				35					
	4,0 mm (0 bar – 70 bar)				40					
Tappet diameter	4,1 mm					41				
Nominal current	12 V						12V			
	24 V						24V			
	no coil						OSP			
Connector type	DIN 43650							DIN		
	DT04-2P							DT0		
	AMP-Junior-Timer							AMP		
	no coil							000		

Check valve cartridges

Axial/radial



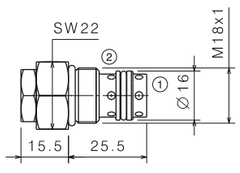
The check valves in the CL02 series have particularly leak-tight, fibre-reinforced plastic sealing elements. In the same cavity, both a radial and an axial outlet can be implemented. Using an axial connection, it is possible to lead a line directly out of the valve block. For this purpose, the valve is threaded in accordance with DIN EN ISO 6149-1. The radial variant is predominantly used in valve sections. All external parts are protected against corrosion.

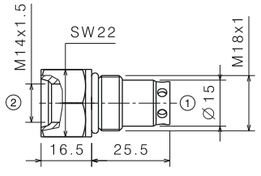
Technical Data

Model	Check valve, poppet type
Installation position	any
Cavity	CL02
Weight	0,07 kg / 0,08 kg
Nominal flow rate	20 l/min
Operating pressure	Max. 210 bar
Opening pressure	Radial: 2,8bar / axial:2,2bar
Leckage *	Max. 3 drops/min. at ΔP 210 bar

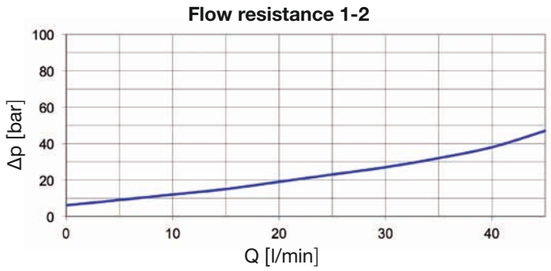
* Data and characteristic curves measured with oil viscosity approx. 35cSt

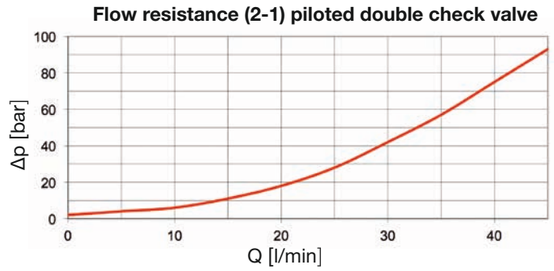
Dimensional drawing





Characteristic curves





Order code

	CC02	-	SVP	-
Series	CLAAS cartridge range CL02			
Type	check valve		SVP	
Version	radial connection			RAD
	axial connection			AXI

Flow control valve

Screw-in/slip-in

The 2-direction flow control valves in the CL02 series are designed as spring-loaded spool valves. Two versions – a screw-in variant and a slip-in valve – are available. By using different orifice diameters in the valve, constant flow rates between 1,3 and 5,0 l/min can be achieved. For reliable continuous operation, the pistons are hardened and ground. All visible parts have a Cr VI-free zinc coating.

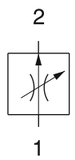
Technical Data

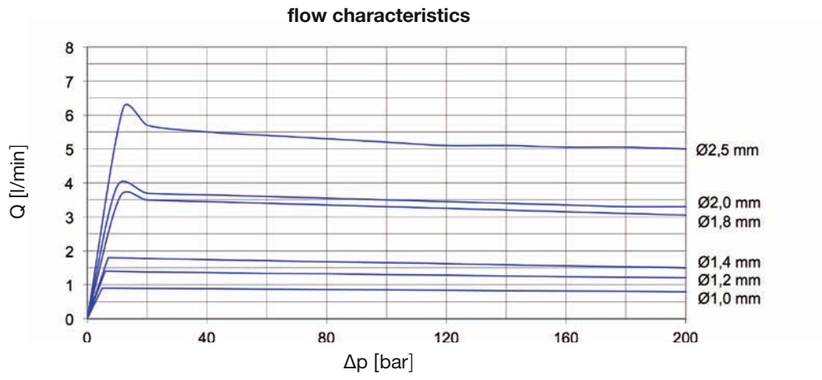
Model	2 way flow control valve, direct acting
Installation position	Preferably suspended
Cavity	CL02
Weight	0,08 kg
Nominal flow rate *	1,3; 1,8; 2,4; 3,1; 3,7; 5,0 l/min
Control pressure differential	7 bar
Operating pressure	Max. 210 bar

* Data and characteristic curves measured with oil viscosity approx. 35cSt

Dimensional drawing

Characteristic curves





Order code	CC02	-	SRV	-		-	
Series	CLAAS cartridge range CL02						
Type	Flow control valves		SRV				
Version	screw-in valve				SCH		
	slip-in valve				SIC		
Nominal flow rate	1,3 l/min.						013
	1,8 l/min.						018
	2,4 l/min.						024
	3,1 l/min.						031
	3,7 l/min.						037
	5,0 l/min.						050

Pressure reducing valve

Mechanical

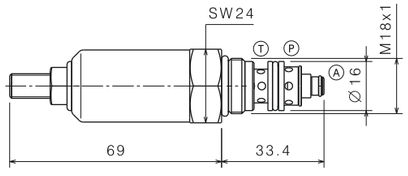
The pressure reducing valve in the CL02 series is designed as a spring-loaded spool valve. The small moving masses and direct control make the valve extremely dynamic and protect the consumers from pressure shocks. The manually adjustable pressure can reach up to 40 bar. The tank connection in the valve enables the current pressure to be limited, even during oil flow in the direction of the valve caused by external loads. A typical application involves supplying a low-pressure system from a high- or medium-pressure system.

Technical Data

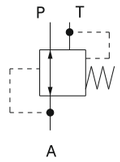
Model	Pressure reducing valve, direct acting, adjustable
Installation position	Preferably suspended
Cavity	CL02
Weight	0,21 kg
Nominal flow rate	5 l/min
Flow rate	Max. 10 l/min
Nominal pressure	Max. 210 bar
Adjustable nominal pressure at A *	Max. 40 bar
Leckage *	Max. 200ml/min at 40bar, static

* Data and characteristic curves measured with oil viscosity approx. 35cSt

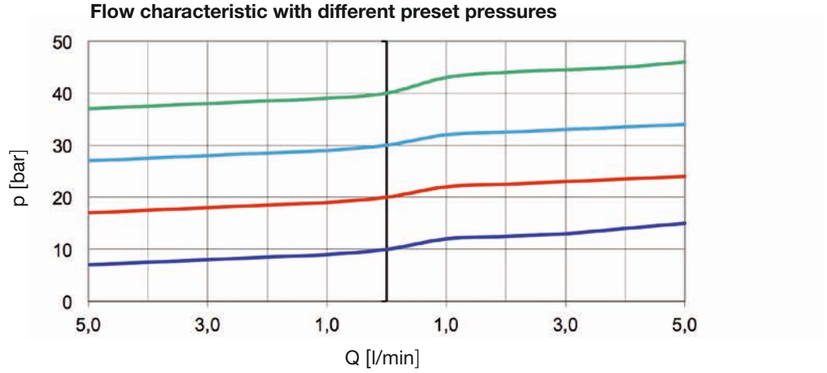
Dimensional drawing



Characteristic curves



Flow characteristic with different preset pressures



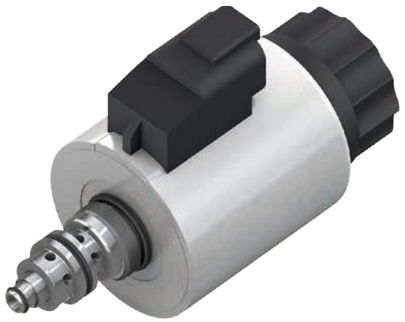
Order code

CC02 - DRV - ME0 - 040 - [ ]

Series	CLAAS cartridge range CL02	
Type	Pressure reducing valve spool type	DRV
Version	mechanical, adjustable	ME0
Pressure range	max. 40 bar	040
Preset pressure	xx bar	xx

Pressure reducing valve

Electric proportional



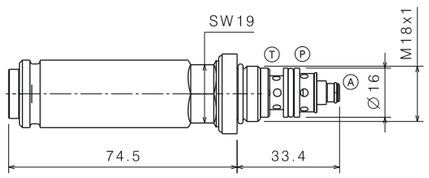
As an alternative to the spring-loaded variants, an electrically proportional pressure reducing valve is also available in the CL02 series. Small moving masses and direct control with a powerful magnet make the pressure reducing valve extremely dynamic – pressure shocks in the hydraulic system are safely balanced and the consumer is protected. Consumer pressures can be adjusted proportionally up to 30 bar using the magnet. The electrical variant also has a tank connection for compensating flow rates in the direction of the valve caused by external loads.

Technical Data

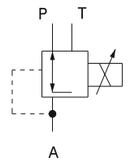
Model	Pressure reducing valve, electric proportional, central venting screw	
Installation position	Preferably suspended	
Cavity	CL02	
Weight (excluding coil)	0,23 kg	
Nominal flow rate	5 l/min	
Flow rate	Max. 10l/min	
Nominal Pressure	Max. 210 bar	
Adjustable nominal pressure at A *	2 – 30 bar	
Leckage *	Max. 200ml/min at 30bar, static	
Nominal voltage	12 VDC; 24 VDC	
Supply voltage tolerance	±10 %	
Duty cycle	100 %	
Nominal current (operating temp.)	12VDC: 0–1,9A	24VDC: 0–1,0A
Electrical resistance (20°C)	12VDC: 4,55Ω	24VDC: 17,6Ω
Optimum PWM frequency *	100 - 150Hz	
Coil type	CC02-MSP-045-PR0	
Standard electrical connection	Deutsch DT04-2P with freewheeling diode	
Coil diameter	45 mm	

* Data and characteristic curves measured with oil viscosity approx. 35cSt

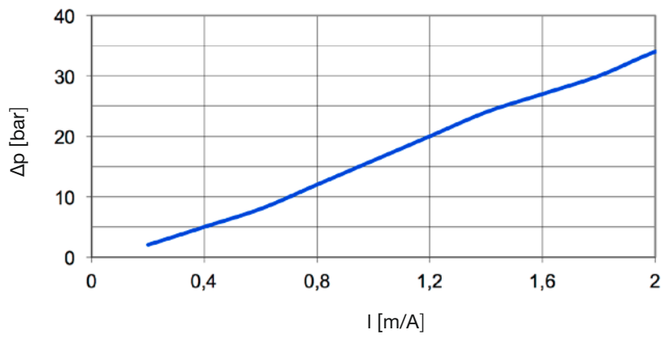
Dimensional drawing



Characteristic curves



Pressure regulation characteristic

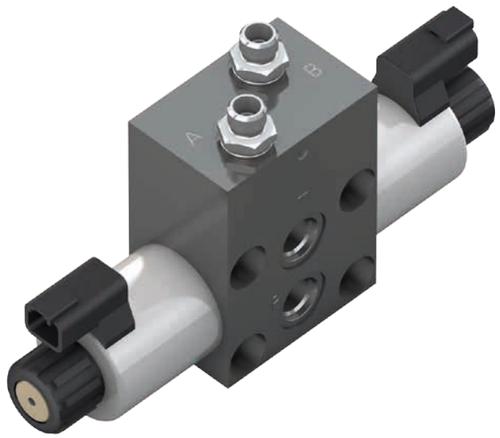


Order code

CC02 - DRV - ME0 - 030 - [ ] - [ ] - [ ]

Series	CLAAS cartridge range CL02	
Type	Pressure reducing valve spool type	DRV
Version	electric	ME0
Pressure range	max. 30 bar	030
Preset pressure	xx bar	xx
Nominal voltage	12 V	12
	24 V	24
	no coil	OS
Connector type	DIN 43650	DIN
	DT04-2P	DT0
	AMP-Junior-Timer	AMP
	no coil	000

Valve section
4/3 directional

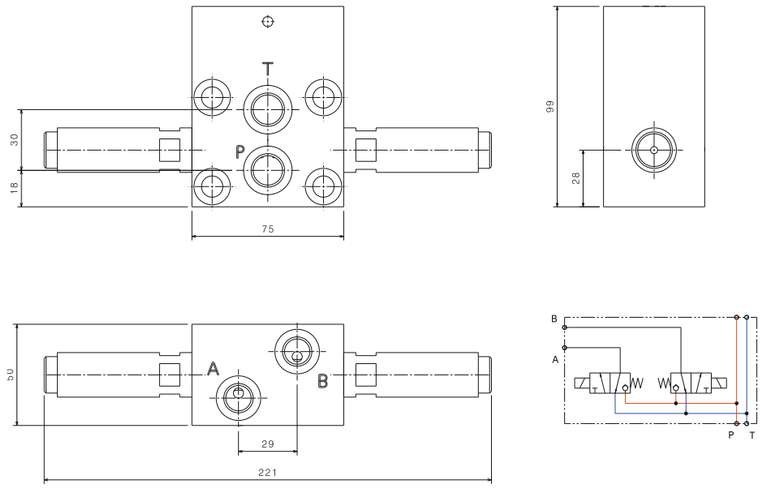


The 4/3 directional function in a valve section made of aluminium is carried out using two freely selectable 3/2 directional cartridges. Depending on the cartridge used, different switching powers and switching characteristics can be achieved. All P and T ports are threaded in accordance with DIN EN ISO 6149-1 meaning that no inlet or end sections are required. As an alternative, it is always possible to flange this valve section, with others, to function blocks. A connection set, consisting of four special screws and two connecting pieces, is required to do this. If required, the connecting pieces can be replaced by valve functions (e.g. flow control valve).

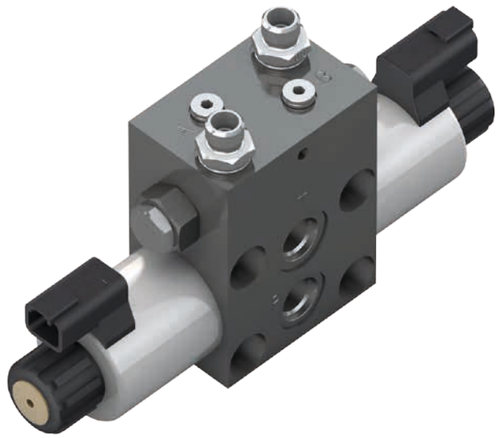
Technical Data

Model	4/3 directional valve section 2x 3/2 directional valves, CL02 cartridges
Nominal pressure	Max. 210 bar
Installation position	Any
Cavity primary axis	CL02
Cavity secondary axis	None
Threaded ports for P and T	M16 x 1,5 DIN EN ISO 6149-1
Threaded ports for A and B	M16 x 1,5 DIN EN ISO 6149-1
Weight (without cartridges)	0,82 kg
Nominal flow rate	10 l/min
Flow rate	Max. 20l/min (depending on the cartridges)
Flange design	CL02, for special screws 65mm and connection kit

Dimensional drawing



Valve section
4/3 directional with piloted double check valve

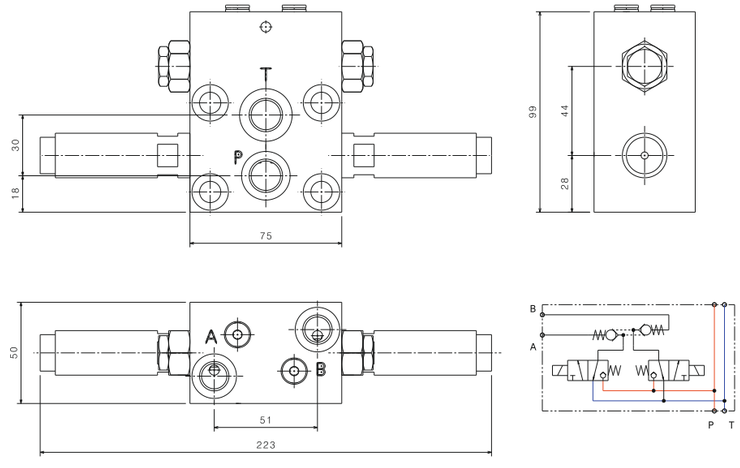


This 4/3 directional valve section with a piloted double check valve made from aluminium also has two unlockable check valves in the consumer ports, which can be unlocked using a control piston with a pressure ratio of 1:4. The consumer ports are located on the upper side of the valve, or alternatively on the side, in the form of an axial output of the check valve.

Technical Data

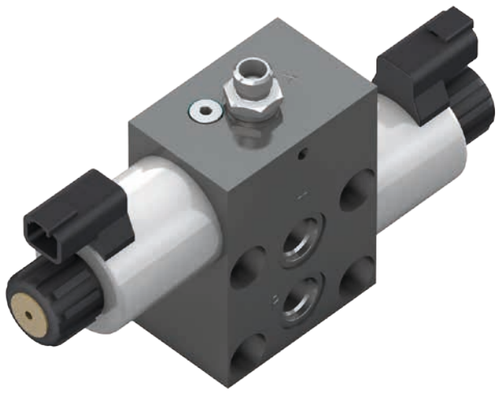
Model	4/3 directional valve section with piloted double check valve 2x 3/2 directional valves, CL02 cartridges
Nominal pressure	Max. 210 bar
Installation position	Any
Cavity primary axis	CL02
Cavity secondary axis	CL02
Threaded ports for P and T	M16 x 1,5 DIN EN ISO 6149-1
Threaded ports for A and B	M14 x 1,5 DIN EN ISO 6149-1
Weight (without cartridges)	0,77 kg
Nominal flow rate	10 l/min
Flow rate	Max. 20l/min (depending on the cartridges)
Pilot ratio of double check valve	4:1 mit CL02 Sperrventil
Flange design	CL02, for special screws 65mm and connection kit

Dimensional drawing



Valve sections

3/3 directional

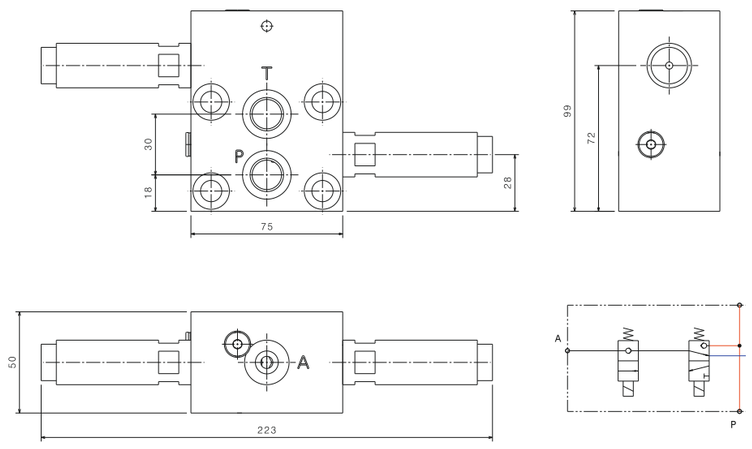


The aluminium 3/3 directional valve section has a 2/2 directional and a 3/2 directional switching element. Differential restrictors or different male connectors with orifices are available for port A. A sample use is the control of single-acting hydraulic cylinders, with the functions „raise“, „lower“ and „load holding“. All P and T ports are threaded in accordance with DIN EN ISO 6149-1 meaning that no inlet or end sections are required. As an alternative, it is always possible to flange this valve section, with others, to function blocks. This only requires four special screws and two connecting pieces. As with all CL02 valve sections, the connecting pieces can also be replaced by valve functions for the 3/3 directional valve section.

Technical Data

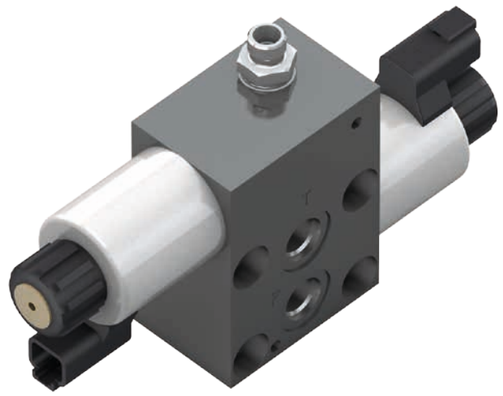
Model	3/3 directional valve section 3/2 directional and 2/2 directional CL02 cartridge
Nominal pressure	Max. 210 bar
Installation position	Any
Cavity primary axis	CL02
Cavity secondary axis	CL02
Threaded ports for P and T	M16 x 1,5 DIN EN ISO 6149-1
Threaded ports for A and B	M14 x 1,5 DIN EN ISO 6149-1
Weight (without cartridges)	0,82 kg
Nominal flow rate	10 l/min
Flow rate	Max. 20l/min (depending on the cartridges)
Flange design	CL02, for special screws 65mm and connection kit

Dimensional drawing



Valve sections

3/3 directional with bypass check valve

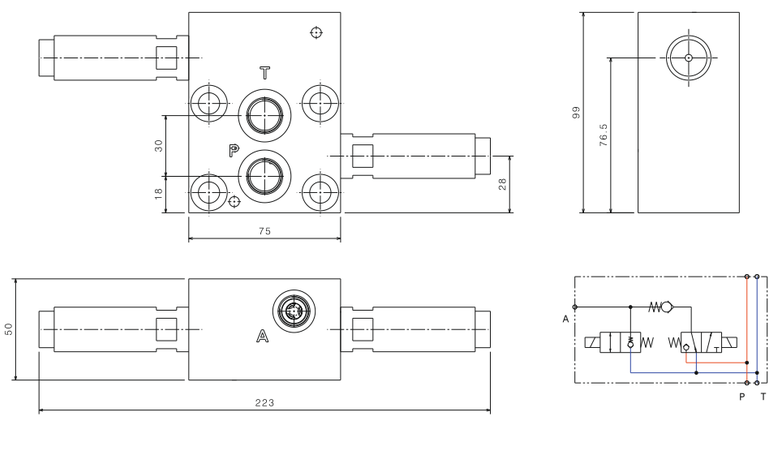


The aluminium 3/3 directional valve section also has a 2/2 directional and a 3/2 directional switching unit. To reduce flow losses, a bypass check valve is also fitted. All P and T ports are threaded in accordance with DIN EN ISO 6149-1 meaning that no inlet or end sections are required. As an alternative, it is always possible to flange this valve section, with others, to function blocks. This only requires four special screws and two connecting pieces. As with all CL02 valve sections, the connecting pieces can also be replaced here by valve functions.

Technical Data

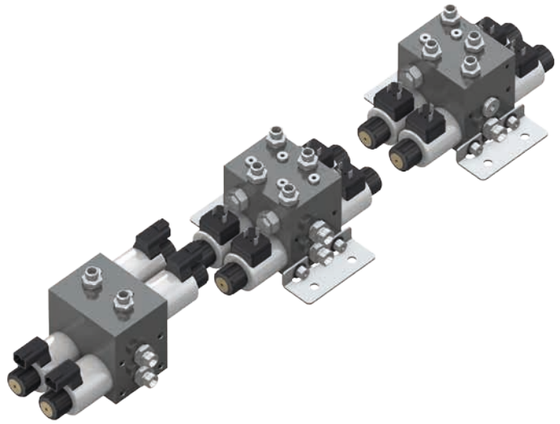
Model	3/3 directional valve section with bypass check vavle 3/2 directional, 2/2 directional cartridge and CL02 check valve
Nominal pressure	Max. 210 bar
Installation position	Any
Cavity primary axis	CL02
Cavity secondary axis	CL02
Threaded ports for P and T	M16 x 1,5 DIN EN ISO 6149-1
Threaded ports for A and B	M14 x 1,5 DIN EN ISO 6149-1
Weight (without cartridges)	0,82 kg
Nominal flow rate	10 l/min
Flow rate	Max. 20l/min (depending on the cartridges)
Flange design	CL02, for special screws 65mm and connection kit

Dimensional drawing



Control blocks

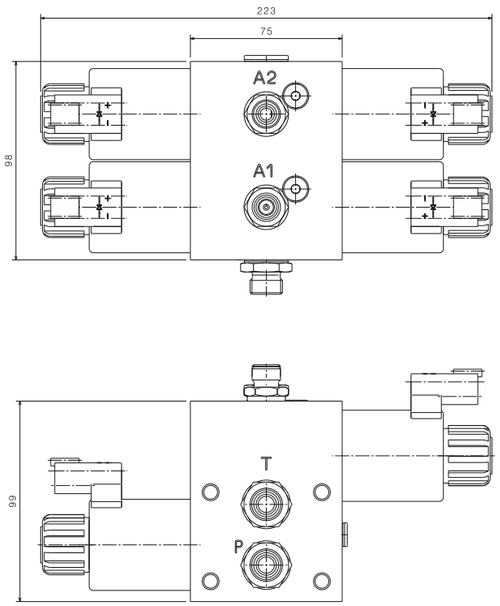
Standard

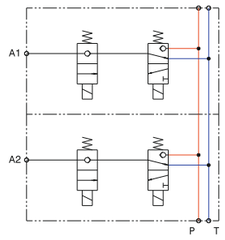


To fit modular equipment variants to your machines easily, standard basic blocks are available in the CL02 series, which already combine various valve functions. You can easily flange additional required functions to these basic blocks in the form of CL02 valve sections. It is possible to fit a modular valve block on both sides of the basic block. The block can also be connected to the pump and the tank from both sides.

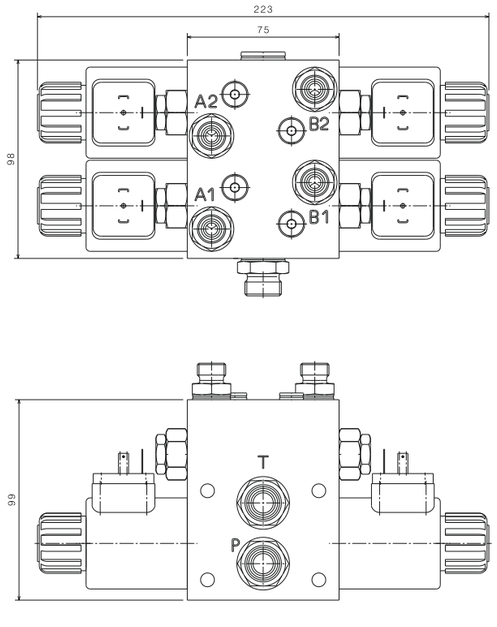
Dimensional drawing

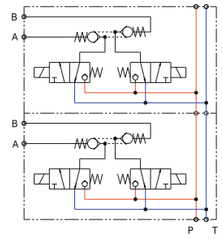
Standard block 2x 3/3 directional valves



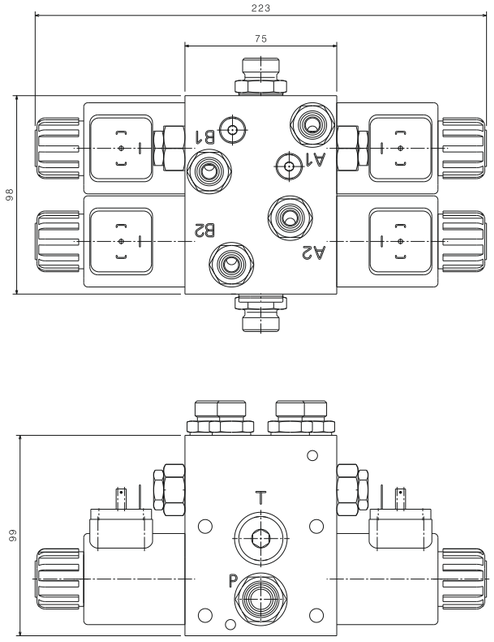


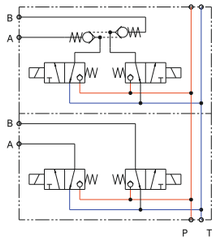
Standard block 2x 4/3 directional valves with double check valve



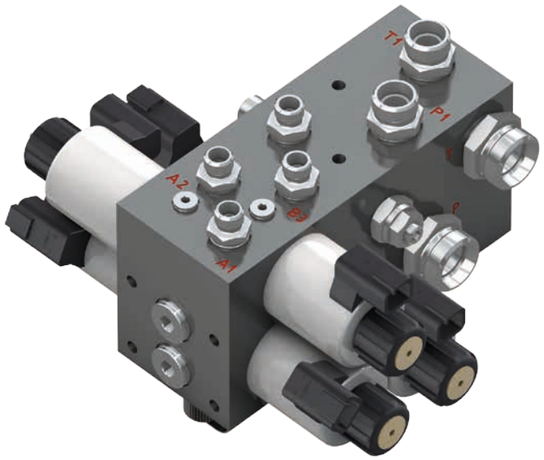


Standard block 4/3 and 4/3 directional valve with double check valve



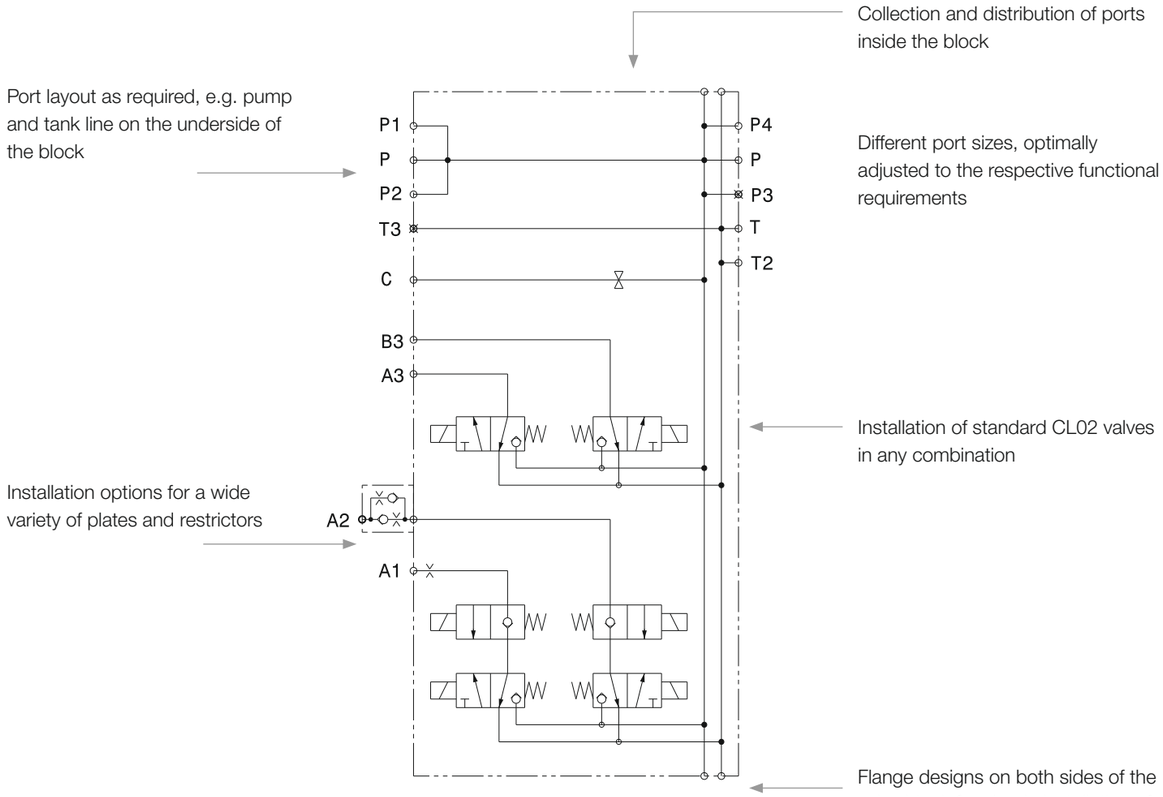


Control blocks
Customer-specific

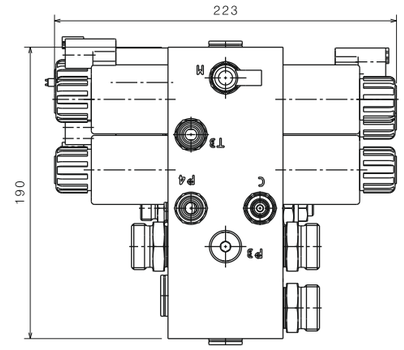


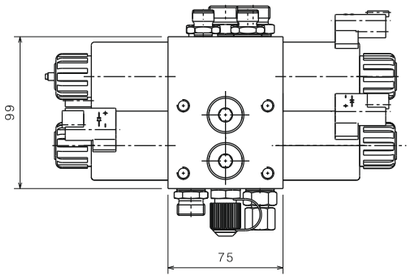
In addition to the standard basic blocks, if required, customer-specific blocks can also be created, which are exactly adjusted to the respective machine requirements. The valve block shown here is intended to show an example of the options.

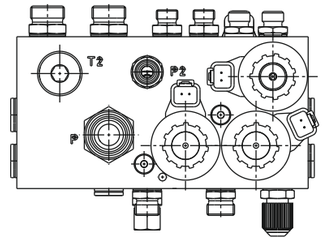
Dimensional drawing



Concept representation

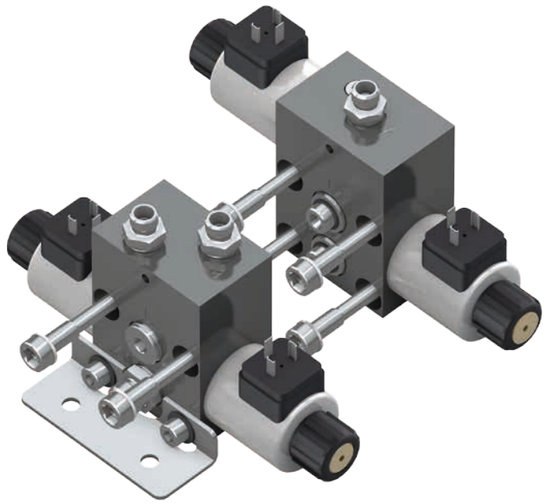






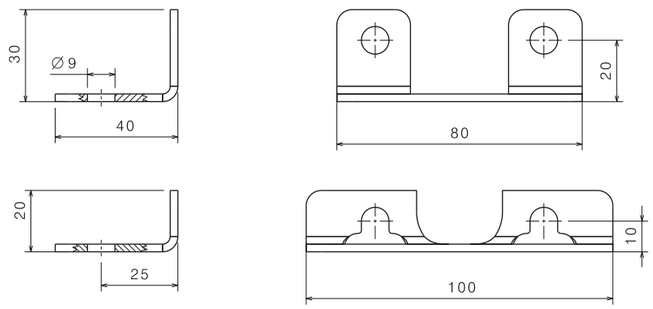
CL02 flange concept

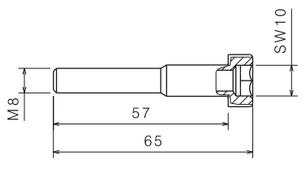
Fasteners



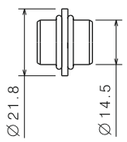
All CL02 valve sections can be connected in a flange configuration according to the „screw-in-screw“ principle using four special screws. The space-saving internal thread in the screw head allows valve sections to be added subsequently without having to undo connections to the valve block made up to that point. You can therefore still respond flexibly to customer demands for optional equipment in final assembly. Of course, the usual installation method using stud screws is still possible, irrespective of this concept.
A mounting kit, including screws and brackets, is available for attaching the control block securely in the machine. If required, the brackets can be prefitted at the factory for easy assembly. M8 tapped holes at a distance of 55 mm must be provided on the machine. The larger mounting bracket allows the valve block to be fitted to the machine at a distance of 10 mm.

Dimensional drawing





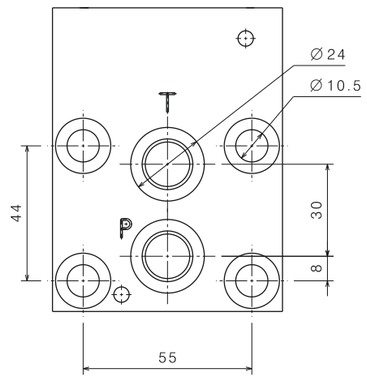
Special screw M8
for section width 50mm
0040 114.X

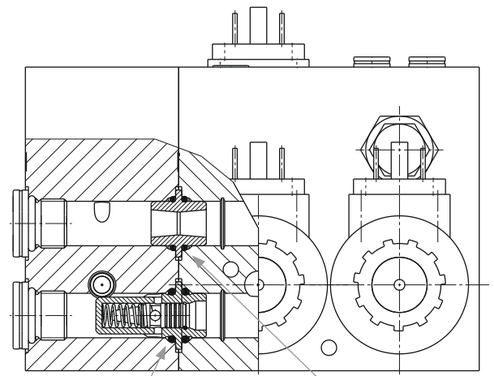


Connection piece
2x O-ring
Ø14 x 1,78 NBR90

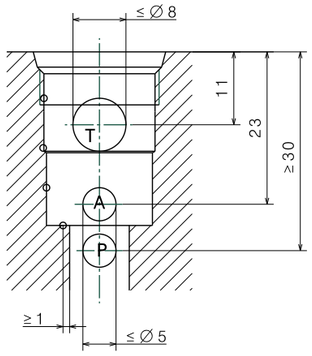
Connection kit: 0040 116.X
4x special screw M8
2x connection piece

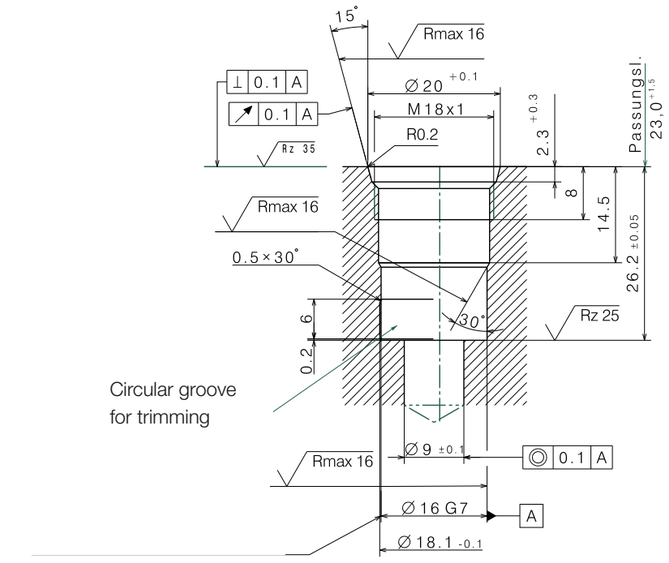
CL02-flange connection





CL02-cavity



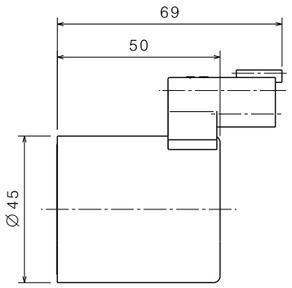


Alternative: Ø 16,1 +0,5/-0,09
for 2/2 directional poppet valve, pressure reducing valve or flow control valve.

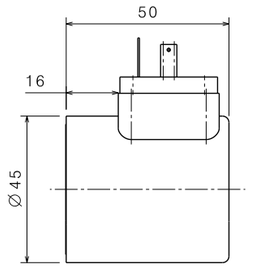
Solenoid coils

Dimensional drawing for coils D45

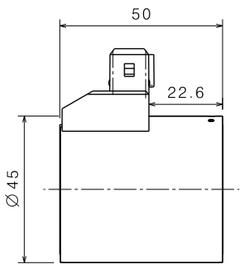
DT04-2P
12/24 V
Switching solenoid



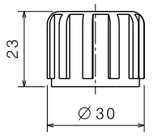
DIN-43650
12/24 V
Switching solenoid



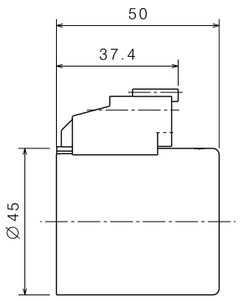
AMP-JT
12/24 V
Switching solenoid



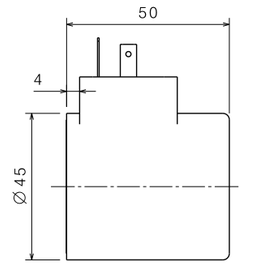
Nut M18x1 0039 394.0
O-Ring DIN 3771
Ø22.0 x 2.5 NBR 70
0211 813.X



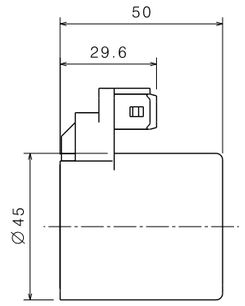
DT04-2P
12/24 V
Proportional solenoids



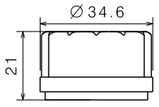
DIN-43650
12/24 V
Proportional solenoids



AMP-JT
12/24 V
Proportional solenoids



Nut M22x1.5 0056 405.X
O-Ring DIN 3771
Ø22.0 x 2.0 NBR 70
0211 507.X



Order code

	CC02	-	MSP	-	045	-		-		-		-								
Series	CLAAS cartridge range CL02																			
Solenoids			MSP																	
Diameter	45 mm				045															
Switching characteristic	Proportional						PR0													
	switching						SW0													
Nominal voltage	12 V								012											
	24 V								024											
Duty cycle*	60 %										60									
	100 %										10									
Connector type	DIN 43650												DIN							
	DT04-2P												DT0							
	DT04-2P with freewheeling diode												DTD							
	AMP-Junior-Timer												AMP							

* proportional solenoids always 100%

Technical Data, switching solenoids

	45er switching solenoids 60% ED								45er switching solenoids 100% ED							
	12 V				24 V				12 V				24 V			
	DTD	DT0	DIN	AMP	DTD	DT0	DIN	AMP	DTD	DT0	DIN	AMP	DTD	DT0	DIN	AMP
Connector type	DT04-2P		DIN-43650	AMP-JT	DT04-2P		DIN-43650	AMP-JT	DT04-2P		DIN-43650	AMP-JT	DT04-2P		DIN-43650	AMP-JT
Free wheeling diode (in connector marked in blue)	yes	x	x	x	yes	x	x	x	yes	x	x	x	yes	x	x	x
Diameter [mm]	45 +0,1								45 +0,1							
Nominal voltage	12 VDC				24 VDC				12 VDC				24 VDC			
Duty cycle	60 %								100 %							
Resistance (at 20°C) [Ω]	3,4				13,9				4,7				19,1			
Watts	46 W								34 W							
Protection class (with mounted plug)	IP67 IPX9k	IP67 IPX9k	IP65	IP65	IP67 IPX9k	IP67 IPX9k	IP65	IP65	IP67 IPX9k	IP67 IPX9k	IP65	IP65	IP67 IPX9k	IP67 IPX9k	IP65	IP65
Thermal protection class	F (DIN VDE 0580) up to 155° C								F (DIN VDE 0580) up to 155° C							
Weight [kg]	0,351 kg				0,365 kg				0,358 kg				0,355 kg			

Technical Data, proportional solenoids

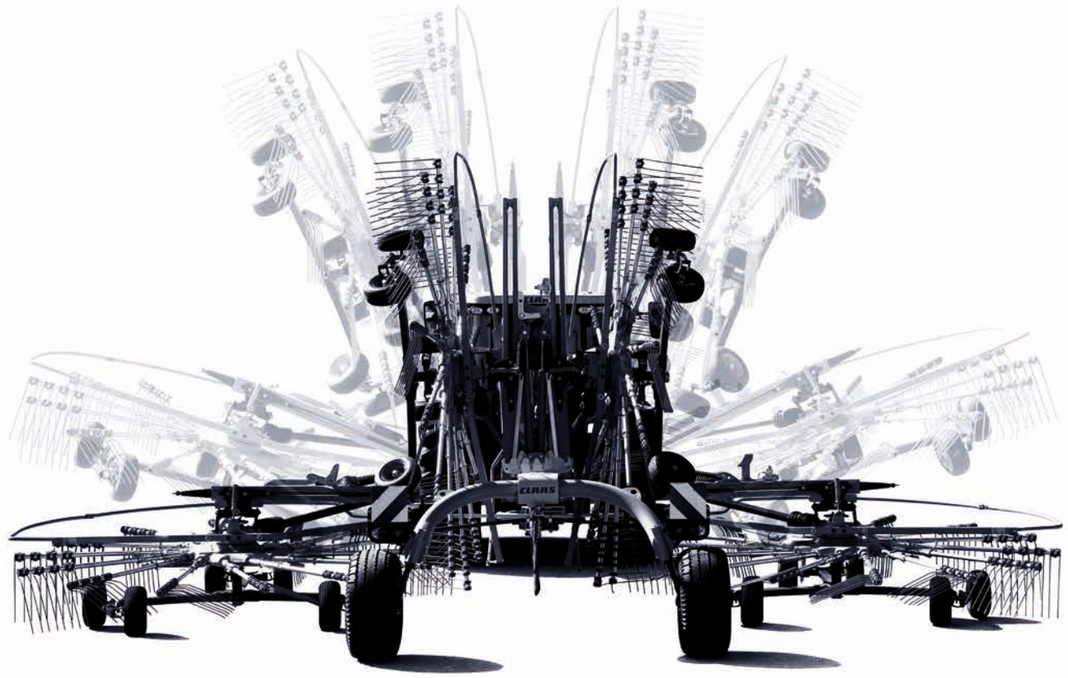
	45er proportional solenoids					
	12 V			24 V		
	DTD	DIN	AMP	DTD	DIN	AMP
Connector type	DT04-2P	DIN-43650	AMP-JT	DT04-2P	DIN-43650	AMP-JT
Resistance (at 20°C) [Ω]	4,55			17,6		
Diameter [mm]	45 +0,6					
Nominal voltage	12 VDC			24 VDC		
Duty cycle	100 %					
Nominal current	1,9 A			1,0 A		
Watts (at 20°C)	33 W					
Protection class (with mounted plug)	IP67 IPX9k	IP65	IP65	IP67 IPX9k	IP65	IP65
Thermal protection class	H (DIN VDE 0580) up to 180° C					
Weight [kg]	0,37 kg					

Modular mobile hydraulic system – Individual control block

The modular mobile hydraulic system is characterised by the combination of different valve series in a single valve block:

- CL06 proportional valves
- CL04 and CL02 directional cartridge valves
- ND50 low pressure valves

The sectional valves are flanged to a central inlet section, e.g. CL06 on the left side and CL04 and / or CL02 on the right side. Special adapters also enable various valve series to be connected together directly. The possibility of connecting individual valve sections means that all customer-specific functions can be realised in just one valve block.



Up to 8 valve sections from one series or, if combined with special adapters, from different series can be flanged together.

Up to 8 valve sections from one series or, if combined with special adapters, from different series can be flanged together.

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