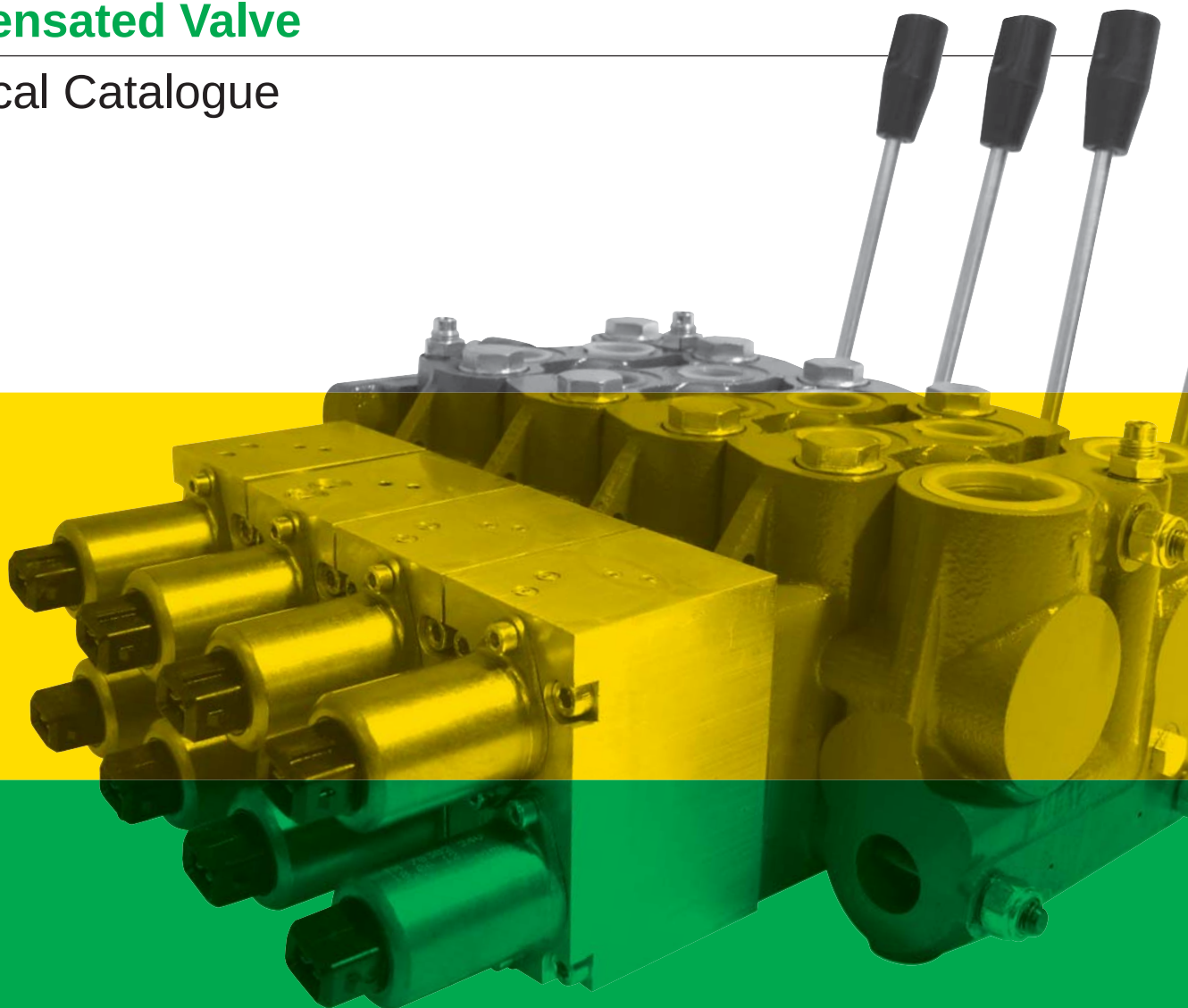


VDP08 and JOYSTICK

Load-Sense Proportional Pressure Compensated Valve

Technical Catalogue

EO.003.0613.14.001M00



Company
with quality system
certified by DNV
UNI EN ISO 9001/2008



L'**Azienda Salami Spa** rappresenta un'eccellenza italiana nel settore della potenza idraulica applicata a macchine mobili e veicoli industriali.

E' stata fondata nel 1956 con precise linee guida che hanno condotto il marchio Salami a identificarsi come simbolo di **Garanzia e Affidabilità** nel proprio settore, in Italia e nel Mondo.

Salami Spa è rimasta fedele nel tempo ai tre punti di forza dettati dal suo fondatore che hanno reso riconoscibile e grande il marchio Salami nel mondo: **Qualità, Innovazione, Servizio**.

Attraverso le proprie sedi di Spagna, Francia, Stati Uniti d'America, Canada e ai suoi partner commerciali, distribuisce i propri prodotti mettendo al servizio del mondo intero l'eccellenza ingegneristica italiana.

In questo volume vi presentiamo il restyling del distributore load sensing elettroproporzionale VDP08, una valvola distributrice pre-compensata che vi permetterà di regolare con la massima precisione una portata agli utilizzi fino a 95 l/min (25 gpm).

La prima sezione del catalogo è centrata interamente sulla descrizione dettagliata di questo prodotto.

La seconda sezione è intitolata "Dealer" ed in essa troverete i principali ricambi e i sottogruppi che compongono il distributore. Questi sottogruppi, già collaudati al 100% sui nostri banchi prova, vi permetteranno di assemblare rapidamente ed in piena autonomia le più comuni configurazioni di VDP08 richieste dal mercato.

Nella terza ed ultima sezione troverete una novità del mondo Salami. Si tratta della descrizione dettagliata di Joystick e relativi cablaggi, parte integrante del pacchetto che i nostri ingegneri hanno messo a punto per voi fornendovi soluzioni "plug and play".

- 1. Innovazione ingegneristica**
- 2. Perfezionamento tecnologico**
- 3. Flessibilità nella configurazione**
- 4. Semplicità nel montaggio**

Queste le parole chiave che caratterizzano il nostro nuovo prodotto nel suo insieme, sviluppato seguendo una logica modulare che vi permetterà di rendere estremamente semplici le operazioni di assemblaggio e installazione.

Pensando a voi, il nostro obiettivo è stato quello di rendere il VDP08 "semplicemente" migliore. La sua affidabilità è garantita, come sempre, dai nostri tecnici specializzati che hanno effettuato numerosi test sul campo ed oltre 1.000.000 di cicli di funzionamento sul banco prova in condizioni estreme.

Potrete trovare inoltre un video esplicativo sul funzionamento di questo "pacchetto" nel nostro canale Youtube.

Auguri di "semplice" successo!

Il Direttore Commerciale
Michele Piazza

*The **Salami Company** is one of the best Italian engineering excellences in the field of hydraulic power applied to mobile applications.*

*It was founded in 1956 with specific guidelines that have led the brand to identify Salami Spa as a symbol of **Warranty and Reliability** in its sector in Italy and in the World.*

*Salami Hydraulics has remained loyal in time to its three strengths dictated by its founder that have made the brand Salami recognizable and great in the world: **Quality, Innovation and Service**.*

Through its offices in USA, Canada, Spain, France, together with its business partners, it distributes its own products by putting the excellence of Italian engineering at the service of the whole world.

In this volume we present the restyling of the load sensing electro-proportional directional control valve VDP08, a pre-compensated control valve that will allow you to regulate with the utmost precision in range/flow rate to use up to 95 l/min (25 gpm).

The first section of the catalogue is centred entirely on the detailed description of this product.

The second section is entitled “Dealer” and in it you will find the main parts and subgroups that make up the directional control valve. These subgroups, already tried 100% on our test benches, will allow you to quickly assemble in complete autonomy the most common configurations VDP08 required by the market.

In the third and final section you will find a novelty in the world Salami. This is the detailed description of Joystick and relative cabling, integral part of the package that our engineers have developed for you by providing solutions “plug and play”.

- 1. Engineering innovation**
- 2. Technological improvement**
- 3. Flexibility in the configuration**
- 4. Simplicity in the installation**

These are the key words that characterise our new product as a whole, developed following a modular logic that will allow you to make the operations of assembly and installation extremely simple. With you in mind, our goal has been to make the VDP08 “simply” better.

Its reliability is guaranteed, as always, by our skilled technicians who have carried out extensive field tests and over 1,000,000 operating cycles on the test bench in extreme conditions.

You will also find an explanatory video on the operation of this “package” on our youtube channel.

Greetings of “simple” success!

Commercial Director
Michele Piazza

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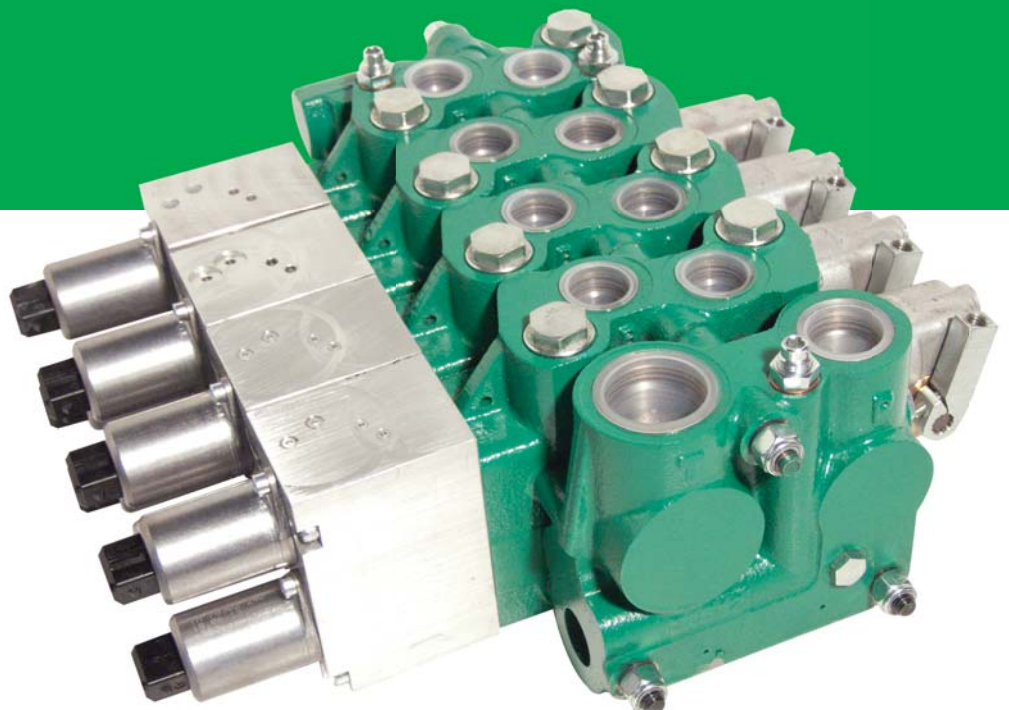
The data on this catalogue refer to the standard product. The policy of Salami consists of a continuous improvement of its products. It reserves the right to change the specifications of the different products whenever necessary and without giving any information. If any doubts, please get in touch with our sales department.



VDP08

Load-Sense Proportional Pressure Compensated Valve

SECTION A - Technical Catalogue



E0.241.0613.02.001M06

FEATURES

OPERATING PRINCIPLE

Load sensing directional control valve VDP08 offers a load-independent flow control (flow in each section depends only by the spool position and not by the load acting on any function), good metering curves and chance of energy saving. The spool acts as a variable throttling on which the pressure drop is maintained constant, so that each spool position arouses a determinate flow rate.

Closed centre version for variable displacement pumps

The valve, through the LS signal, sets the pump displacement on the value required by the actuator plus a little leakage compensation flow, the pump always working almost at minimum power possible, with clear advantages in terms of energy saving.

When several spools are actuated, only the highest of the corresponding LS signals reaches the pump; in the remaining sections the compensators keep the pressure drop on the spool constant, maintaining the flow rate equal to that required by the actuator and independent of the pump pressure.

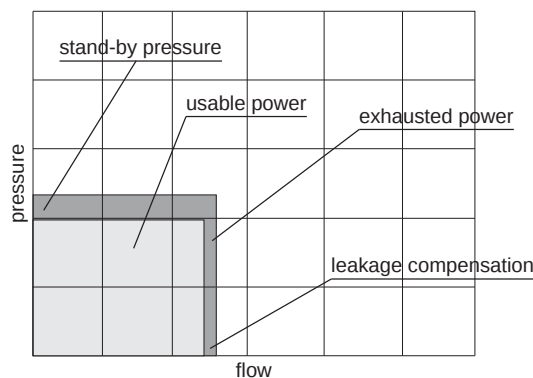
When all the spools are in neutral position (pump stand-by), the pump is required a very little flow (leakage compensation) at the stand-by pressure (14 bar - 200 psi).

Open centre version for fixed displacement pumps

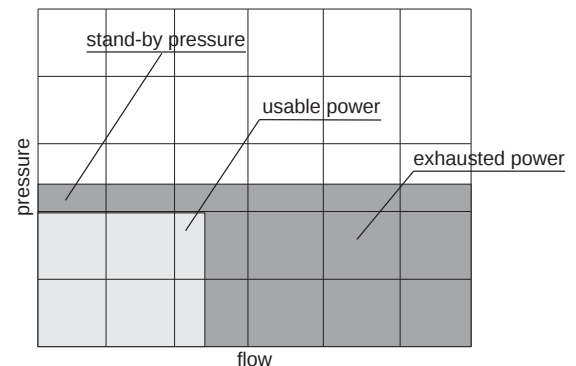
The flow regulator in the inlet module, controlled by the LS signal, drains to tank all the flow exceeding the value required by the actuators, generating in the valve the same working conditions as in case of variable displacement pump.

The advantages due to flow regulation hold, whereas energy saving is strongly cut down.

Load sensing circuit with variable displacement pump
(closed centre)



Load sensing circuit with fixed displacement pump
(open centre)



GENERAL

Among all hydraulic directional control valves used in the field of mobile equipment applications, the spool valve is the most popular.

The sectional valve type allows construction flexibility. Salami directional control valves are modular construction and consist of an inlet/outlet section, up to 8 working sections and an end plate. All these elements are secured in one block by means of tie-rods.

Salami directional control valves have the following features :

- Special cast-iron body;
- Spool construction in steel, hardened and chromium-plated to obtain a higher surface hardness, a better corrosion resistance, and wearing reduction;
- Minimum tolerance between spools and body to obtain a minimum internal leakage;
- Interchangeability of all spools;
- Possibility of auxiliary valves on port A and B
- Several spool controls.



FEATURES

WORKING CONDITION

HYDRAULIC FLUID	Mineral oil according DIN 51524
VISCOSITY	
Viscosity range	10 ÷ 460 mm ² /sec. 0,15 ÷ 7,13 sq.in./sec.
Optimal viscosity	12 ÷ 75 mm ² /sec. 0,19 ÷ 1,16 sq.in./sec.
TEMPERATURE	
Fluid temperature range	- 20 ÷ + 85°C - 4 ÷ + 185°F
Suggested range	+ 30 ÷ + 60° C + 86 ÷ + 140° F
MAXIMUM CONTAMINATION LEVEL	NAS 1638: class 9 ISO 4406: 19/16
ROOM TEMPERATURE	- 30 ÷ + 60°C - 22 ÷ + 140°F
WORKING LIMITS	See diagrams
PRESSURE DROPS	See diagrams
For operation with fire resistant fluids, please contact our sales department.	

DISTRIBUTION PHASES

There are two characteristic phases in the spool stroke (7 mm - 0,275 in.):

- a) the overlap phase (about 18% of the stroke) guarantees minimum internal leakages in neutral position;
- b) the progressive flow regulation phase (82% of the stroke).

TECHNICAL DATA

Max pressure	port P	315 bar	(4560 psi)
	ports A/B	350 bar	(5000 psi)
	port T*	10 bar	(145 psi)
Oil flow rate	port P	up to 130 l/min	(34 gpm)
	ports A/B	up to 95 l/min	(25 gpm)
Internal leakage			
at 160 bar (2285 psi)	ports A/B -->T	30 ÷ 35 cc/min	(1,8 ÷ 2,1 cu.in./min)
Spool stroke		±7 mm	(0,28 in.)
Dead stroke (for spool flow control)		1,8 mm	(0,07 in.)
Operating force (on the spool)	to start	90 N	(20 lbf)
	end stroke	180 N	(40 lbf)
*For higher back pressure please consult our Sales Department.			
All technical data carried out using mineral oil with viscosity of 16 cSt and contamination level 19/16 as ISO 4406.			

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FEATURES

VALVE AND DEVICE TYPES

In order to meet the most stringent demands and to offer a wider range of applications, the following types of auxiliary valves and devices are available:

· **Valves on the inlet**

Main relief valve - VSLS (see page 7A): controls the maximum pressure in the circuit acting on the LS signal that pilots the flow regulator.

Electric unloading valve - EV (see page 9A): if not excited drains the LS signal preventing the valve operation (pump pressure set at the stand-by value 14 bar - 200 psi).

Flow regulator (see page 7A): in the closed centre version serves the only function, driven by VS or EV, to drain the oil flow to tank;

in the open centre version it also regulates the flow rate.

· **Valves on the outlet**

Pressure reducing valve for electrically actuated valves (see pages 16A and 17A): supplies the piloting pressure to electro-hydraulic remote controls.

· **Valves on the section**

LS pressure limiting valves on A and/or B ports - VSLS (see page 14A): limiting the LS signal of the section control the pressure that the section can impose to the circuit. The shuttle valve allows different settings on the two ports.

Overload and anticavitation valve on port A and/or B - AR (see page 14A): avoids pressure peaks on ports A/B connecting the port to tank when pressure exceeds the setting. It also serves an anti-cavitation function.

Anti-cavitation valve on port A and/or B - VR (see page 14A): avoids cavitation due to inertia in the system.

Prearrangement for AR/VR and VSLS (see page 14A): PR and PRVSLS.

EACH DEVICE AND EACH CONFIGURATION REPORTED IN THIS CATALOGUE HAS A CORRESPONDING PART NUMBER IN THE DEALER CATALOGUE.

FOR ORDERING PART NUMBER, PLEASE CONSIDER THE DEALER CATALOGUE.

IN CASE OF MISSING PART NUMBER, PLEASE CONTACT OUR SALES DEPARTMENT.



FEATURES

INSTALLATION

When proceeding to mount the unit on the structure and to connect fittings to work ports, it is necessary to comply with the values of tightening torques (see page 18A).

The attachment of linkages to spools should not affect their operation. The mounting position can be vertical with inlet module on the top or horizontal.

We recommend to fix the valve always using only 3 of the 4 fixing holes, otherwise make sure to interpose 4 rubber insulators between the valve and the machine frame, to avoid valve distortion and spool sticking.

FILTRATION

The contamination of the fluid circulating in the system greatly affects the life of the unit. Above all, contamination may result in irregular operation, wear of seals in valve housings and failures. Once the initial cleanliness of the system has been attained, it is necessary to limit any increase of contamination by installing an efficient filtration system (see working conditions page 2A).

PIPES

Pipes should be as short as possible, without restrictions or sharp bends (especially the return lines).

Before connecting pipes to the fittings of the corresponding components, make sure that they are free from burrs and other contamination.

As a first approximation, for a mobile machine with standard length pipes, their width should guarantee the following values of fluid speed*:

6 ÷ 10 m/sec
3 ÷ 5 m/sec

inlet pipe
outlet pipe

19,7 ÷ 32,8 ft/sec
9,9 ÷ 16,4 ft/sec

inlet pipe
outlet pipe

the lowest values of fluid speed are required in case of wide temperature range and/or for continuous duty.

$$* [v = \frac{21,2 \cdot Q}{d^2}]$$

v = fluid speed [m/sec], Q = flow [l/min], d = pipe internal diameter [mm]

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FEATURES

HYDRAULIC FLUID

Usually a mineral-base oil with a good viscosity index should be used, preferably with good lubricating properties and corrosion, oxidation and foaming resistant.

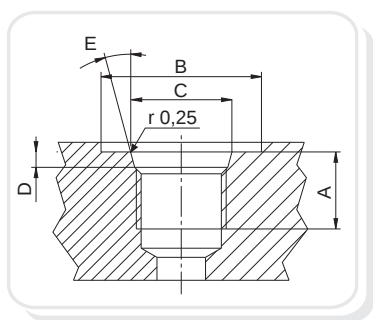
Sometimes the fluids supplied by the manufacturers do not satisfy purity requirements (see WORKING CONDITIONS). It is therefore necessary to filter the fluid carefully before filling. Your supplier can give you the information about NAS class of its fluids. To maintain the proper purity class, the use of filters of high dirt capacity with clogging indicator is recommended.

Under humidity conditions it is necessary to use hygroscopic salts.

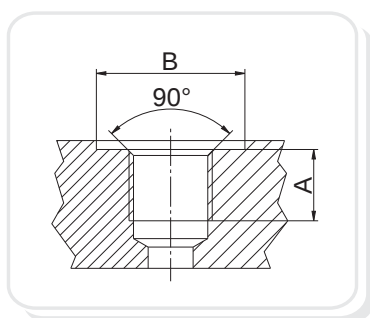
For operation with fire resistant and ecological fluids, please contact our technical department.

PORTS

Following are standard ports. For different port types, please contact our sales department.



SAE UN-UNF (ISO 725)							
Dimensions mm <i>In.</i>		7/8 -14 UNF SAE10		1"1/16 -12 UN SAE12		1"5/16 -12 UN SAE16	
A		17	0,67	20	0,79	20	0,79
B		34	1,34	41	1,61	49	1,92
C		23,9	0,94	29,2	1,15	35,5	1,40
D		2,5	0,10	3,3	0,13	3,3	0,13
E		15°		15°		15°	



BSP (ISO 228)					
Dimensions mm In.	G1/2		G3/4		G1
A	16	0,63	18	0,71	20 0,79
B	27	1,06	33	1,30	40 1,57

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DIMENSIONS

A/B: working ports

P: top inlet port

PL: side inlet port

T: top outlet port

TL: side outlet port

LS (see page 8A):

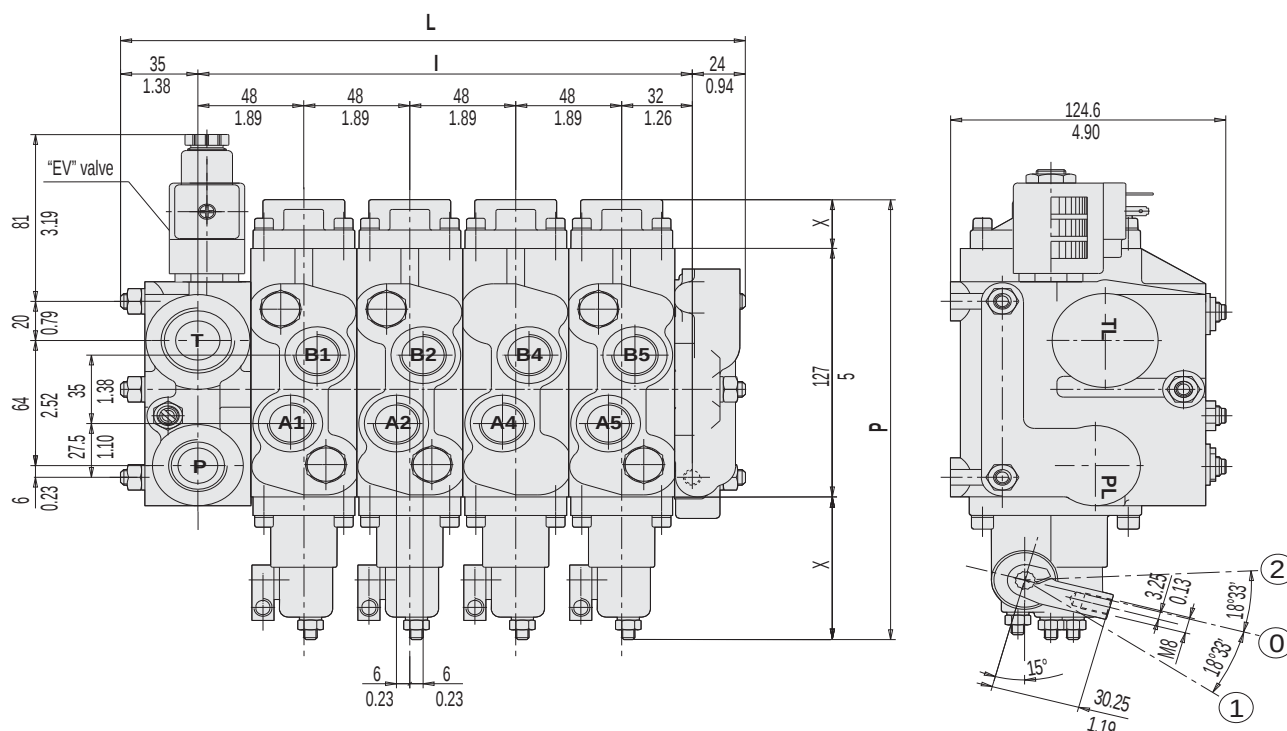
load-sensing signal port

PG (see page 8A):

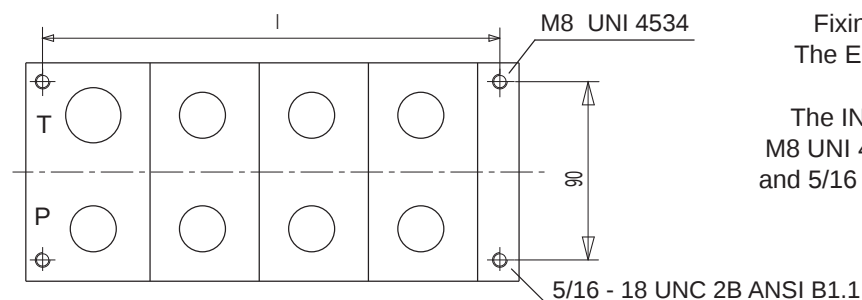
pressure gauge port

Ports Orifices	P/PL	T/TL	A/B	PG/LS
BSP ISO 228	G3/4	G1	G1/2	G1/4
SAE ISO 176	SAE12	SAE16	SAE10	SAE4

The drawing shown is just an example. The overall dimensions you read are valid for all the D.C.V. except the parametric dimensions "L" and "I" depending on the number of working sections. The parametric dimensions "P" depends on a fixed dimension of 127 mm (5 in.) to which you have to add the "X" dimensions that you can find in the following pages.



Nr. sections		1	2	3	4	5	6	7	8
I	mm	80	128	176	224	272	320	368	416
	in	3,14	5,03	6,92	8,81	10,70	12,59	14,48	16,37
L	mm	107	155	203	251	299	347	395	443
	in	4,21	5,47	7,99	9,88	11,77	13,66	15,55	17,44
Mass	kg	8,80	12,8	16,80	20,80	24,8	28,8	32,8	36,8
	lb	19,42	28,25	37,08	45,91	57,74	83,57	72,40	81,23



Fixing holes distance between centers.
The END PLATES are always threaded as shown beside.
The INLET/OUTLET modules are threaded M8 UNI 4534 when the ports are GAS threaded and 5/16 - 18 UNC 2B ANSI B1.1 when the ports are SAE threaded.

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INLET/OUTLET MODULES

OPERATING PRINCIPLES



OPEN CENTRE CIRCUIT WITH FIXED DISPLACEMENT PUMP “CODE F” - SEE PAGE 8A

When the pump is started and main spools in the working modules are in neutral position, oil flows from the pump through P port across the flow regulator to tank T.

The oil flow led across the flow regulator determines the pump pressure (stand-by pressure of 14 bar - 200 psi).

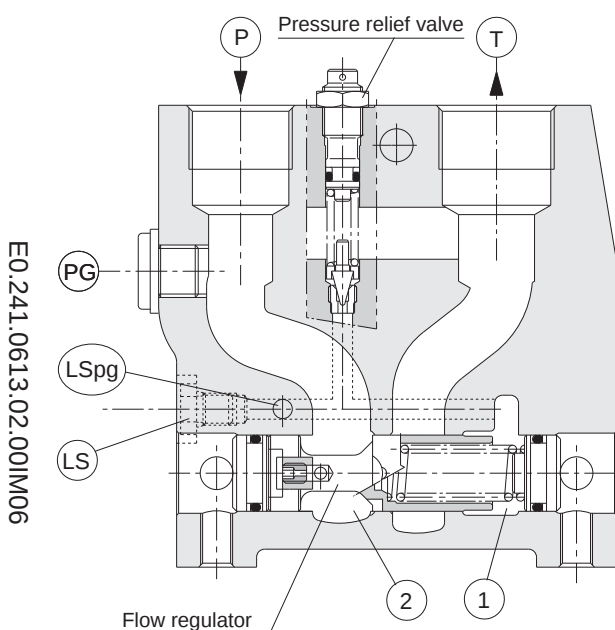
When one or more of the main spools are actuated, the highest load pressure is fed through the shuttle valve circuit ("LS" pilot gallery, see hydraulic circuit at pag.11A) to the spring chamber behind the flow regulator ①, completely or partially closes the connection to tank.

Pump pressure is applied to the left-hand side of the flow regulator ②. The pressure relief valve poppet will open as soon as the load pressure will exceed the set value, so that the flow regulator will shift right diverting pump flow back to tank.

CLOSED CENTER CIRCUIT WITH VARIABLE DISPLACEMENT PUMP “CODE V” - SEE PAGE 8A

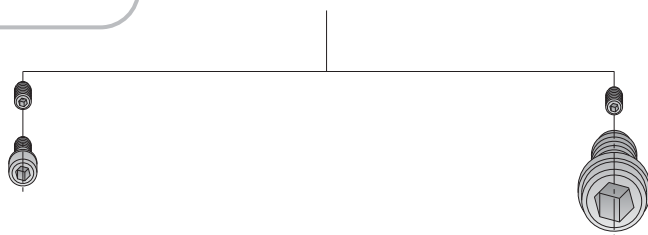
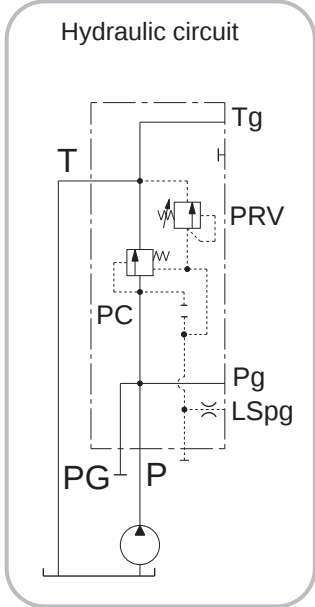
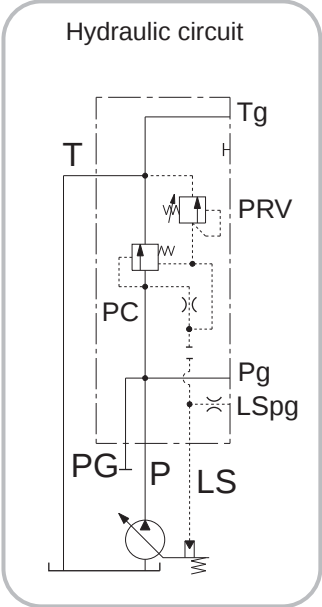
In the closed centre version a throttling ③ and a plug ② have been fitted instead of the plug ①.

This means that the flow regulator will only open to tank when the pressure in channel P exceeds the set value of the pressure relief valve. In load sensing systems the load pressure is led to the pump regulator via the “LS” port.



P INLET PORT
T OUTLET PORT
PG PRESSURE GAUGE PORT
LSpg "LOAD SENSING PILOT GALLERY"
LS LOAD SENSING PORT

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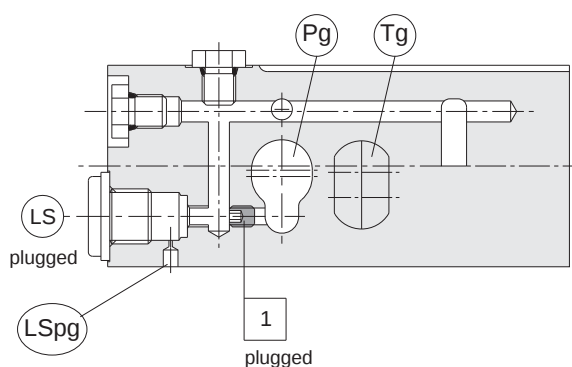
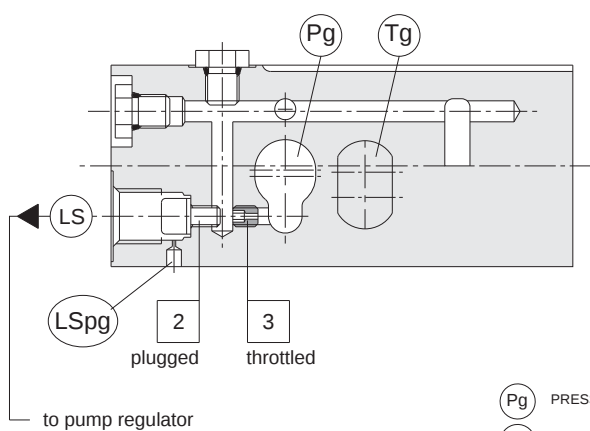


code V

code F

Closed centre for variable displacement pumps

Open centre for fixed displacement pumps

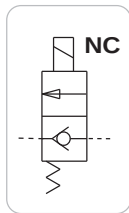
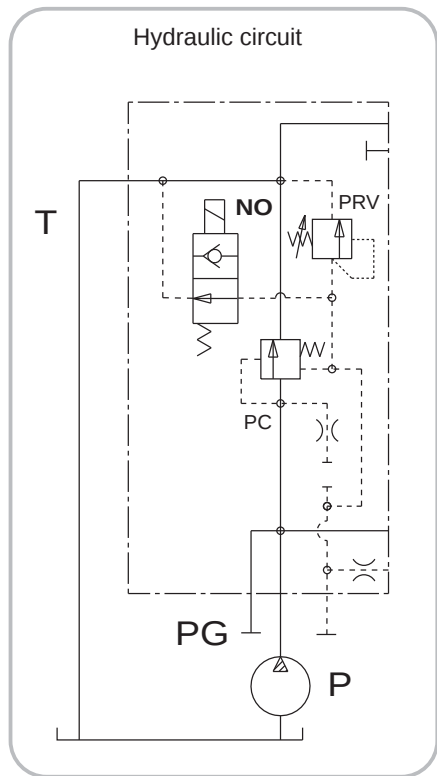


- | | |
|-----|------------------------|
| Pg | PRESSURE COMPENSATOR |
| Pg | PRESSURE GALLERY |
| Tg | TANK GALLERY |
| PRV | PRESSURE RELIEVE VALVE |

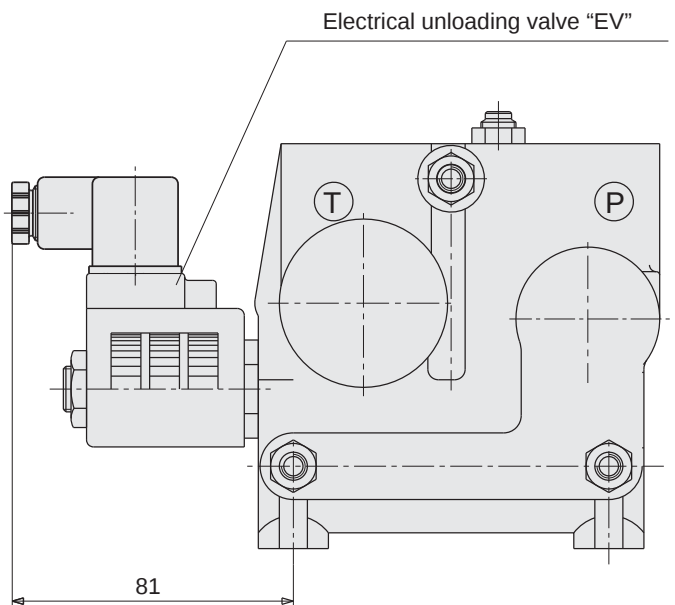
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INLET/OUTLET MODULES

Inlet module circuit with LS electrical unloading valve - “EV”



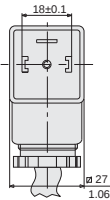
EV1	12 Vcc	normally open
EV2	24 Vcc	open
EV3	12 Vcc	normally closed
EV4	24 Vcc	closed



CIRCUIT DESCRIPTION:

“EV” is an unloading electrovalve of the “LS” signal. “EV” is fitted into the inlet module enabling a connection between the “LS” and the tank lines. The “LS” signal can be relieved to tank switching the electrovalve by an electrical signal.

CONNECTOR
DIN 43650 - A/ISO 4400



“EV” VALVE IN THE OPEN CENTRE CIRCUIT “CODE F”

For an open centre inlet module the relief to tank of the “LS” signal means that the pressure in the system is reduced to the difference of the tank port pressure and the inlet module pressure.

“EV” VALVE IN THE CLOSED CENTRE CIRCUIT “CODE V”

For a closed centre inlet module the relief to tank of the “LS” signal means that the pressure in the system is reduced to the difference of the tank port pressure and the stand-by pressure of the pump.

SPECIFICATIONS	
- MAX PRESSURE IN P”	350 bar
- MAX FLOW	10 l/min
- OIL LEAKAGE	82 cc/min
- AVAILABLE VOLTAGE	12 - 24 Vcc
- COIL RESISTANCE	12Vcc:5.1 Ω - 24 Vcc:20.5 Ω
- PROTECTION INDEX WITH STANDARD CONNECTOR	IP 65

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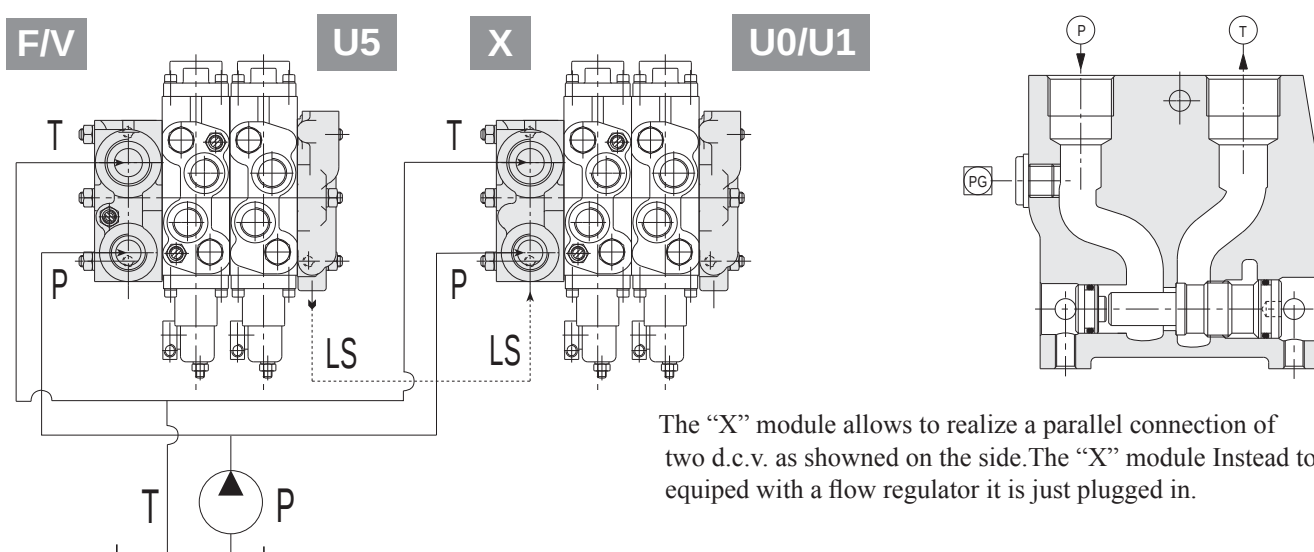


INLET/OUTLET MODULES

Inlet module for parallel connected valves

code X

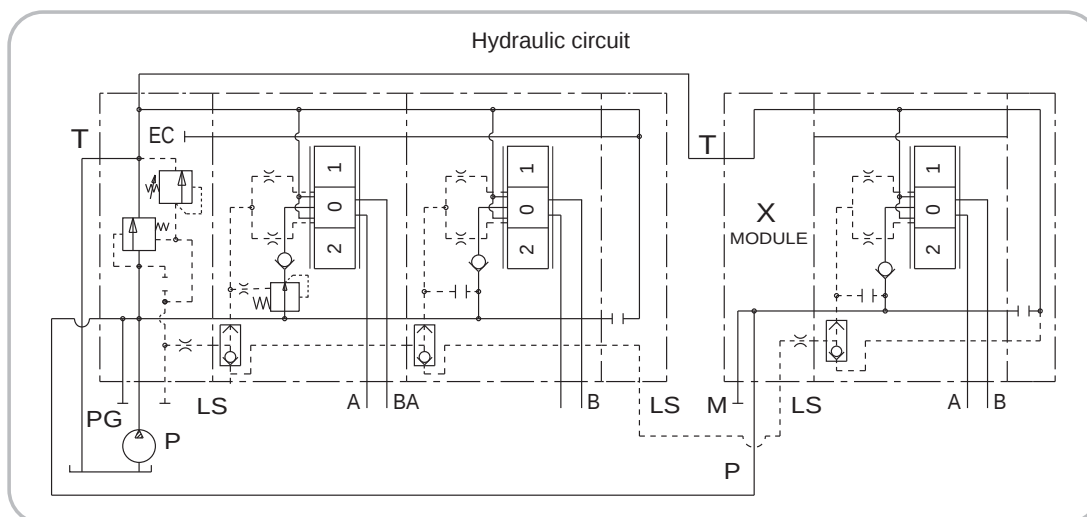
Before to order this code, please get in touch with our sales dept.



The "X" module allows to realize a parallel connection of two d.c.v. as shown on the side. The "X" module instead of being equipped with a flow regulator it is just plugged in.

The hydraulic circuit shows the upstream d.c.v. with "F" inlet module (for fixed displacement pump) and the downstream valve with the "X" inlet module. The downstream d.c.v. takes the "LS" signal from the end module of the upstream d.c.v. The same d.c.v. connection could be done with a "V" module in the upstream d.c.v. (for variable displacement pump). The end module of the upstream d.c.v. has to be designed as "U5".

EXAMPLE OF CIRCUIT TYPE



E0.241.0613.02.00IM06

WORKING MODULES

WORKING MODULE WITH PRESSURE COMPENSATOR

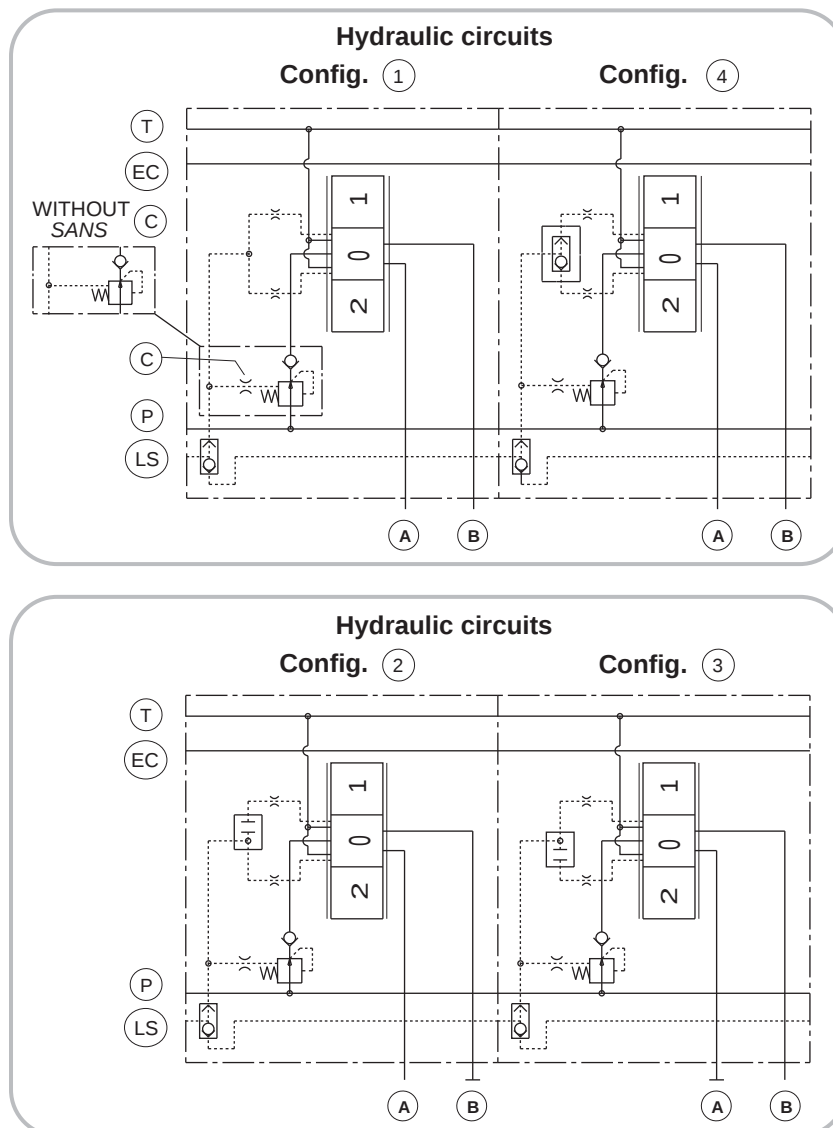
GENERAL FEATURES

In a pressure-compensated working module the compensator maintains a constant pressure drop across the main spool - both when the load changes and when a module with a higher load pressure is actuated.

CIRCUIT CONFIGURATIONS

The pressure compensated working module is available in four circuit configurations (see figures beside), where you can introduce all the spool circuits that you can find from page 19A to page 22A. In this way we can have a vast range of circuit types. The drawings at page 12A show the components required to obtain the four different circuit configurations.

The plug ① is used just to close a machining hole. The pivots ② and ③ replace the plug ① in case we have a single acting spool instead of a double. The pivot ④ is used with "LS" pressure limiting valves on A and B ports. It has a shuttle valve built-in that selects the "LSA" and "LSB" signals, coming from working ports and limited by "LS" pressure valves. To ensure a stabler "LS" signal the throttling ⑤ is always mounted. Throttling ⑤ can be removed if required.

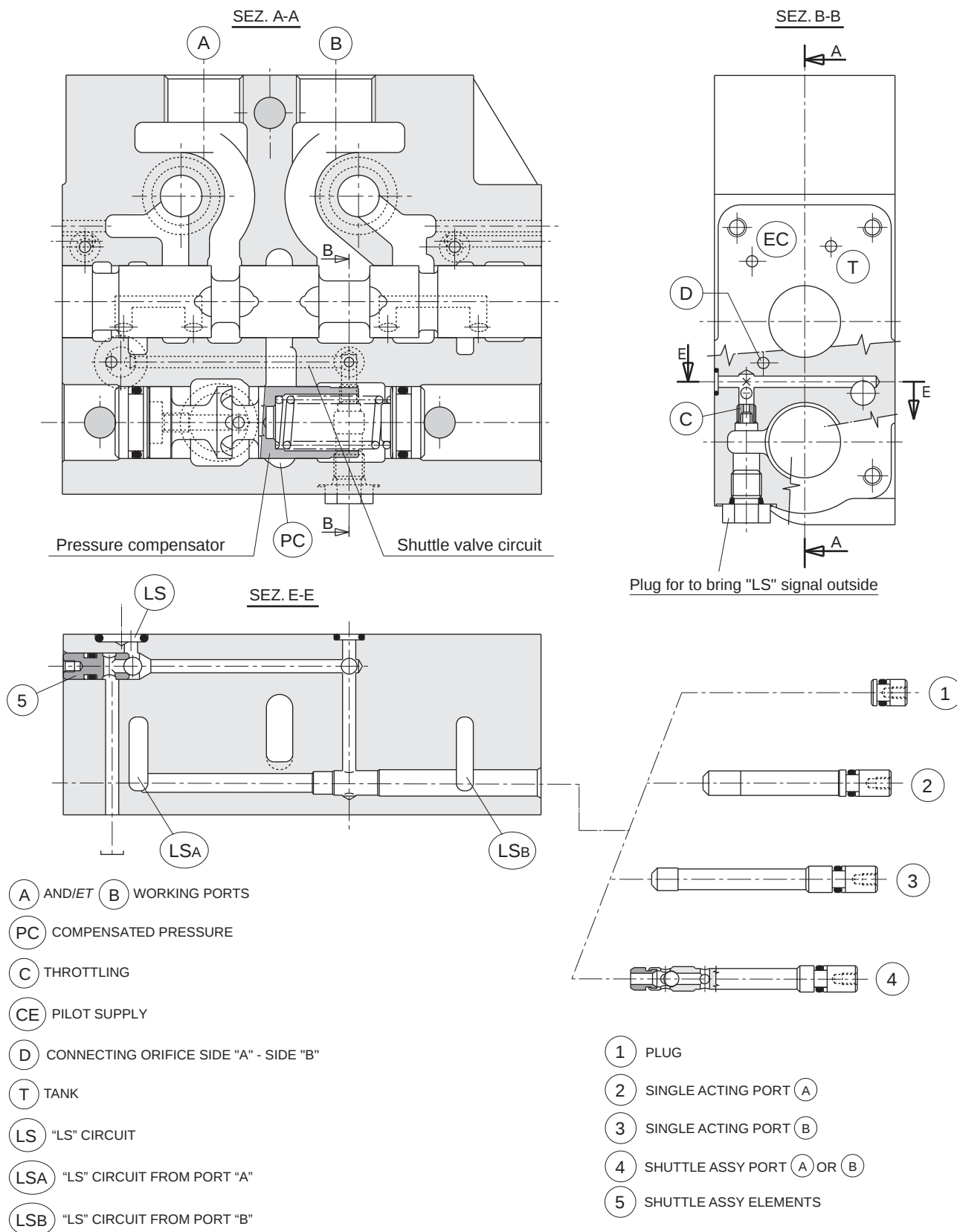


EO.241.0613.02.001M06



WORKING MODULES

WORKING MODULE WITH PRESSURE COMPENSATOR



E0.241.0613.02.00IM06

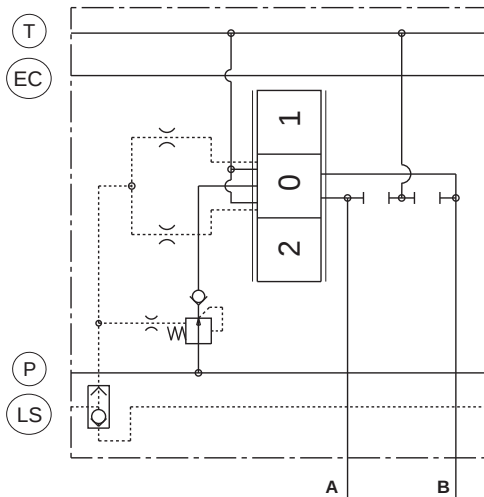


WORKING MODULES

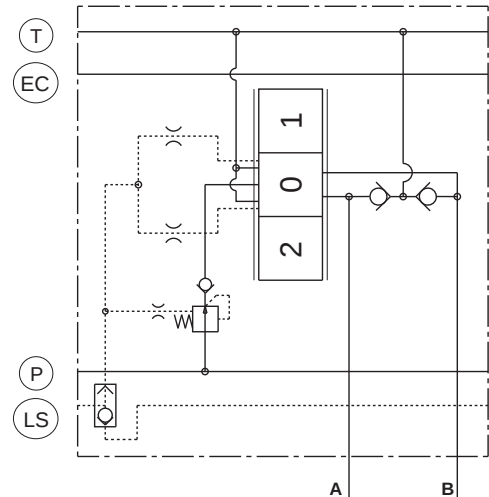
AVAILABLE VALVE TYPES ON A/B PORTS

Available circuits

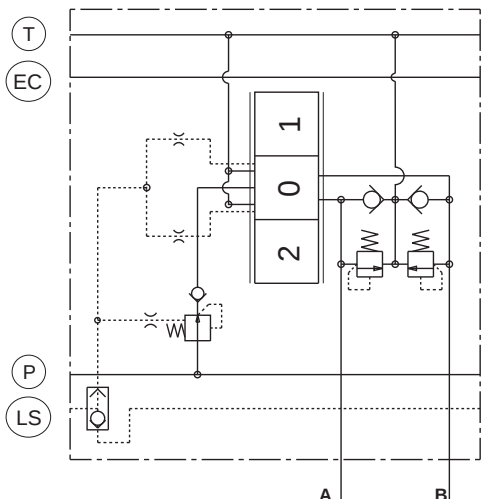
PR - Prearranged for VR - AR



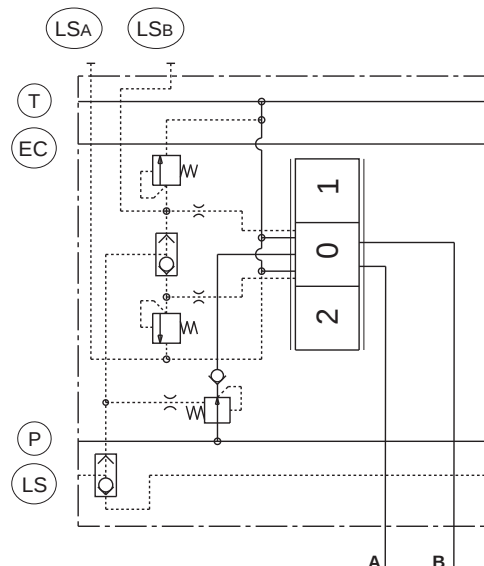
VR - Anti-cavitation valve



AR - Overload and anti-cavitation valve



VSLs - LS_{A/B} - Pressure limiting valve



GENERAL FEATURES

The hydraulic circuits of the different available valves are here shown, in the next page the valves location on the working module.

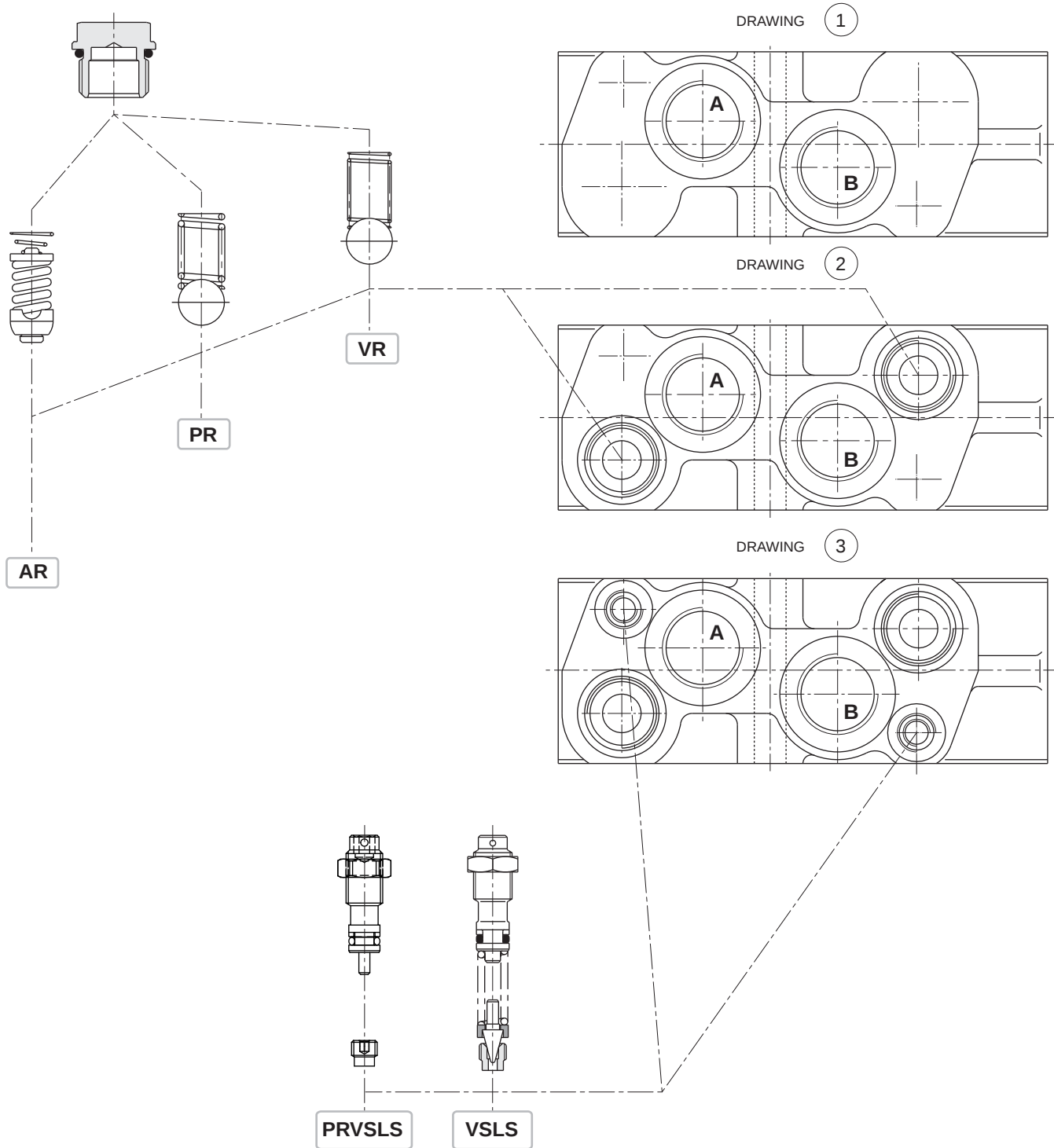
As shown on page 14A in drawing ① a working module without valves, in drawing ② a module with pre-arrangement for (VR) - (AR). Remind that the (AR) valve setting is fixed. In drawing ③ a module with two additional valve seats where the (VSLs) valves can be fitted. As shown in the circuit, this module offers the chance to pick up the "LS" signals from A and B ports removing the two plugs in the bottom of the module.

EO.241.0613.02.001M06



WORKING MODULES

AVAILABLE VALVE TYPES ON A/B PORTS



AR - Overload and anticavitation valve

VR - Anticavitation valve

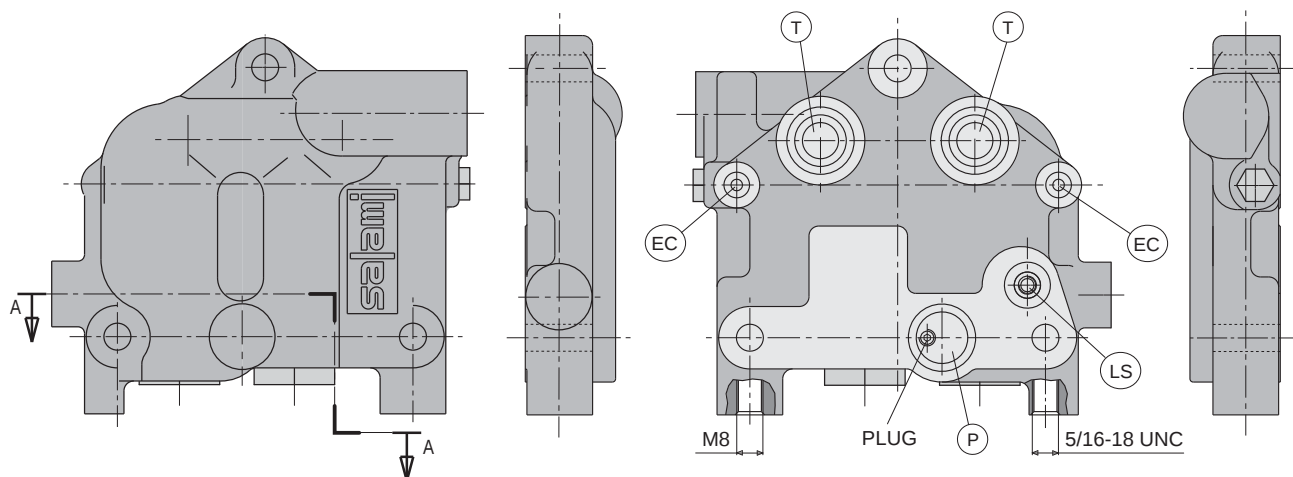
PR - Prearranged for AR / VR

PRVSLS - Prearranged for VSLS

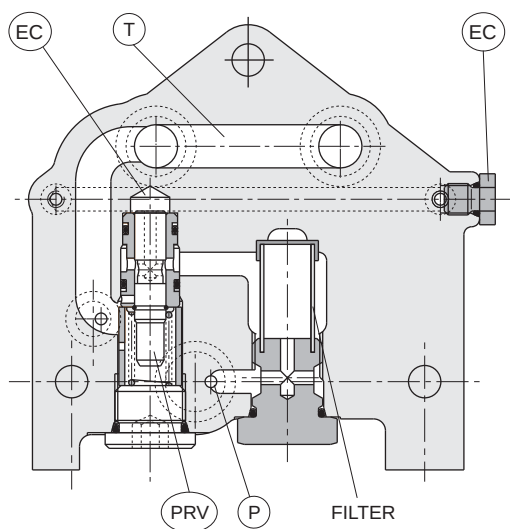
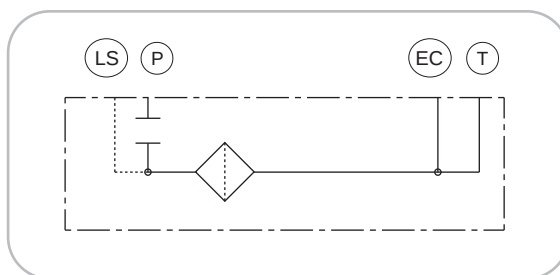
VSLS - LS pressure limiting valve

END PLATE

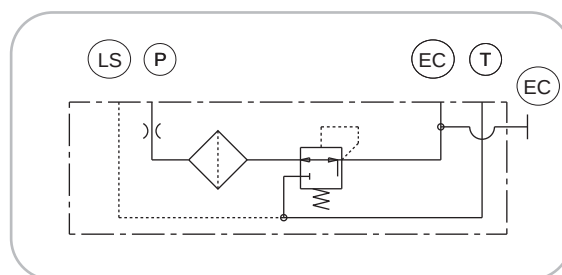
AVAILABLE CIRCUIT



code U0



code U1



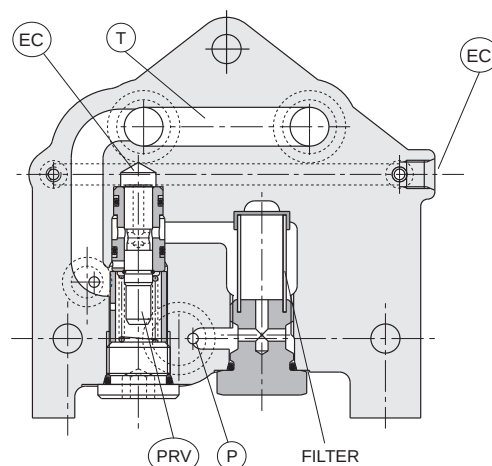
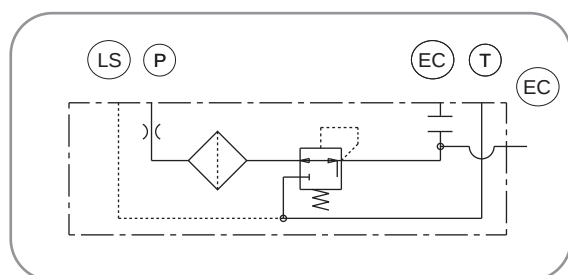
“U1” end plate integrates the reducing pressure valve (PRV) which draws “P” signal, when reducing it to a pressure of approx. 10 to 28 bar, sending it to “EC” circuit for feeding the electrohydraulic controls.

EO.241.0613.02.001M06

END PLATE

AVAILABLE CIRCUIT

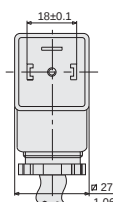
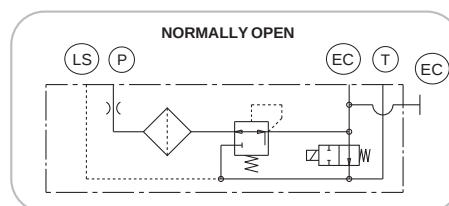
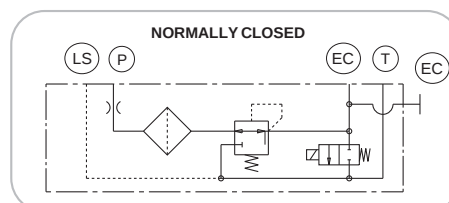
code U2



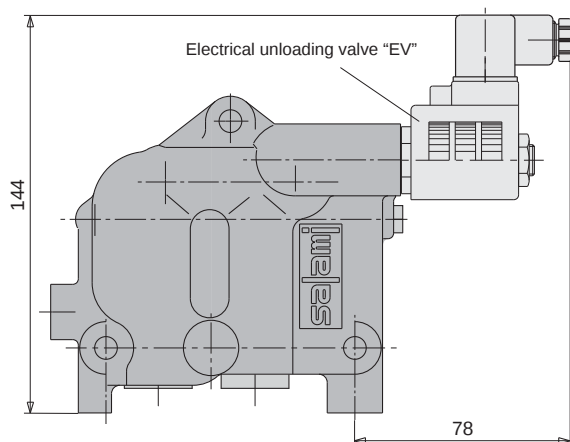
"U2" end plate integrates the reducing pressure valve (PRV) which draws "P" signal, when reducing it to a pressure of approx. 10 to 28 bar, obtaining in this way an external piloting signal which can be used by a joystic or an electrovalve for to operate "IP" controls. In this case "EC" piloting inside the valve is plugged.

SPECIFICATIONS

- MAX PRESSURE IN P"	207 bar
- MAX FLOW	10 l/min
- OIL LEAKAGE	82 cc/min
- AVAILABLE VOLTAGE	12 - 24 Vcc
- COIL RESISTANCE	12Vcc: 5.1 Ω - 24 Vcc: 20.5 Ω
- PROTECTION INDEX WITH STANDARD CONNECTOR	IP 65

CONNECTOR
DIN 43650 - A/ISO 4400

12 Vcc - code U3
24 Vcc - code U4

12 Vcc - code U6
24 Vcc - code U7


E0.241.0613.02.00IM06

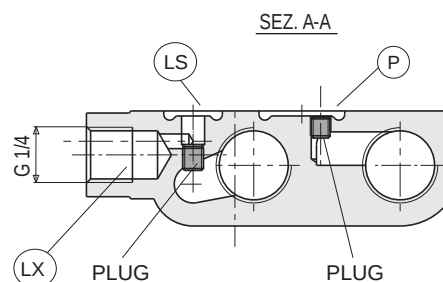
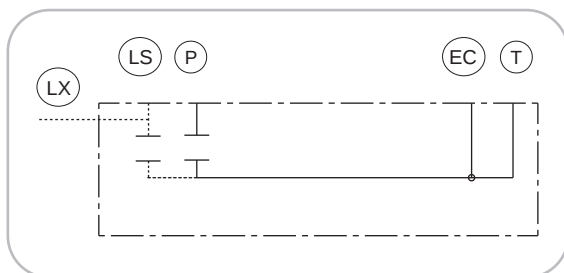


"U3-U4" and "U6-U7" end plates integrate (PRV) valve for electrohydraulic circuits and can also release the "EC" piloting by the electrovalve, which can be normally open or closed.

END PLATE

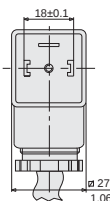
AVAILABLE CIRCUIT

code U5



"U5" end plate allows to come out with "LS" signal in order to obtain a parallel circuit with a downstream VDP08 valve complete with a suitable inlet (see page 10A). This becomes possible when plugging "LS" signal (see figure).

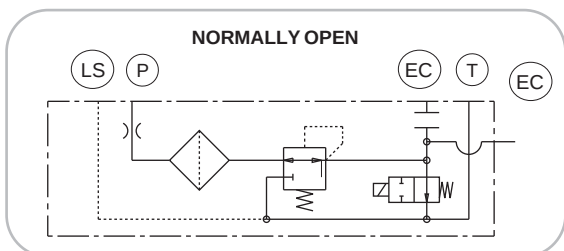
CONNECTOR DIN 43650 - A/ISO 4400



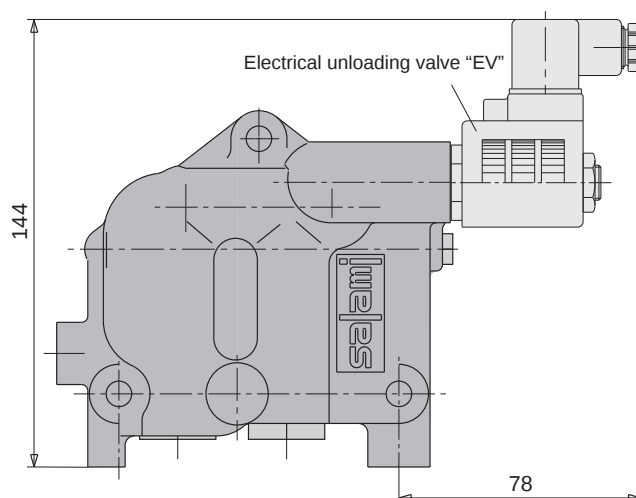
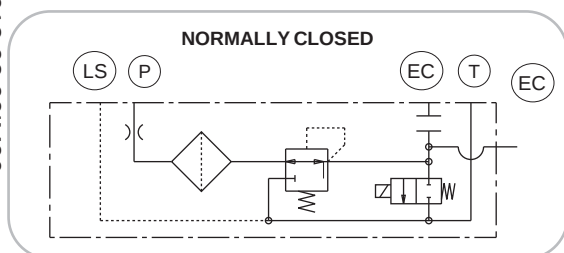
SPECIFICATIONS

- MAX PRESSURE IN P"	207 bar
- MAX FLOW	10 l/min
- OIL LEAKAGE	82 cc/min
- AVAILABLE VOLTAGE	12 - 24 Vcc
- COIL RESISTANCE	12Vcc: 5.1 Ω - 24 Vcc: 20.5 Ω
- PROTECTION INDEX WITH STANDARD CONNECTOR	IP 65

12 Vcc - code U8 24 Vcc - code U9



12 Vcc - code U10 24 Vcc - code U11



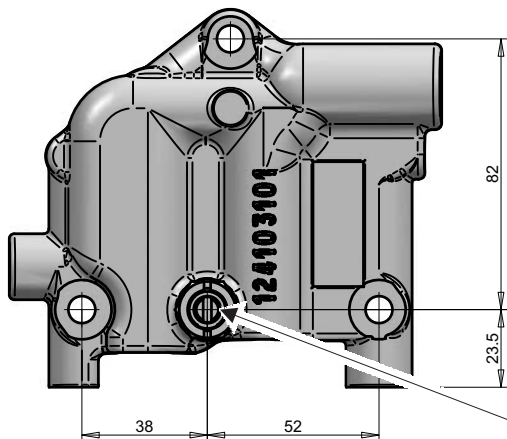
"U8-U9" and "U10-U11" end plates integrate (PRV) valve and can also release the "EC" external piloting by the electrovalve, which can be normally open or closed.

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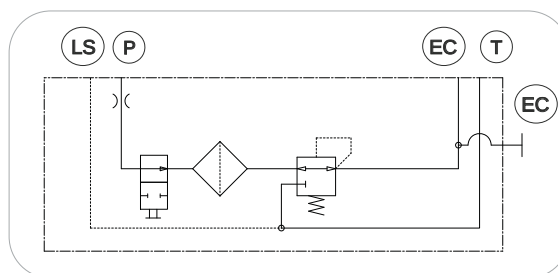


END PLATE

AVAILABLE CIRCUIT



code U12



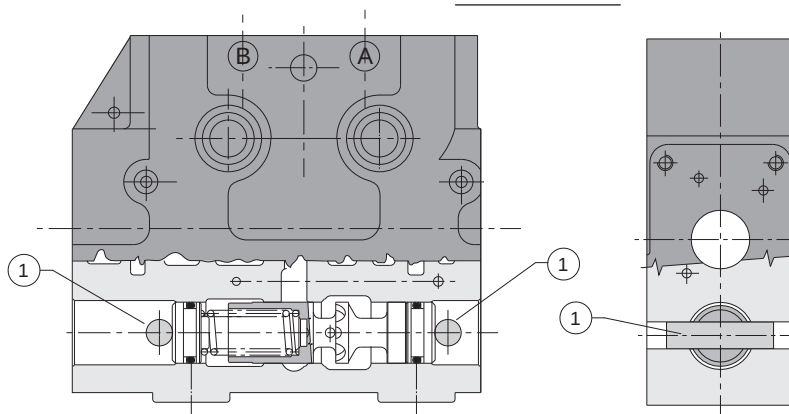
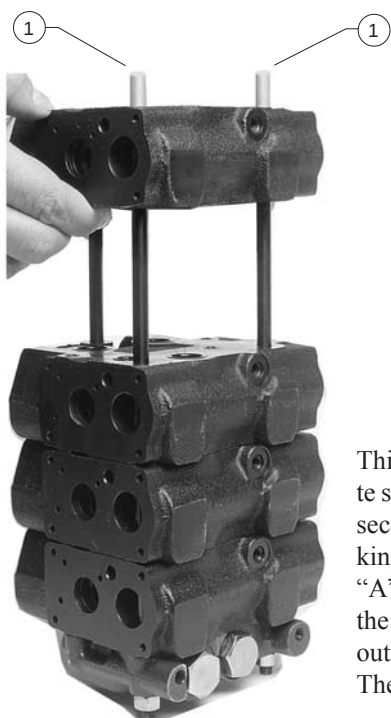
BY-PASS VALVE

“U12 “ end plate integrates the reducing pressure valve (PRV) which draws “ P “ signal when reducing it to a pressure of approx. 10 to 28 bar. sending it to “ EC “ circuit for feeding the electro-hydraulic controls. The by-pass valve can exclude the reducing pressure valve (PRV) and the electronic devices.

Special release made in order to be able to put in pressure VDP08 electro-hydraulic with a hand pump. The hand pump is commonly used as an emergency device in the field of aerial platforms. Before to order this code , please get in touch with our sales dept.

ASSEMBLYING SECTIONS ISTRUCTIONS

DRAWING "A"



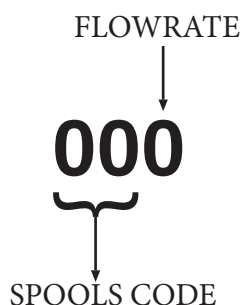
This assembling procedure is mainly suitable for customers who purchase VDP08 complete sections and assemble them by themselves, but can also be useful to add further working sections or to modify the circuit, replacing, a few parts when having a complete valve. Working sections and inlet modules are equipped with a small cylinder of teflon (see drawing “A”). This cylinder has to keep compressed the pressure compensator. If not, it could stop the fixing holes of the tie-rods. When assembling, you have to insert the tie-rods, which take out the teflon cylinder from its hole without any obstacle (see side picture). The necessary torque for the screws is 28 Nm.

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TYPES OF SPOOLS AVAILABLE

During the spools construction by appropriate notches dimensioning we can to obtain different type depending of the flow rates.

Each spool has a description with three digits, that allow to understand immediatly the working principle and the flowrate.



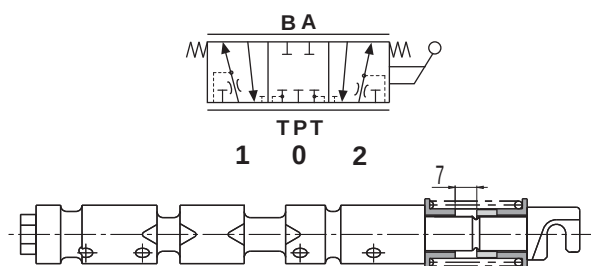
Type	Flow control from - up to
1	Working port flow rate 8 l/min. - 2,1 gpm.
2	Working port flow rate 16 l/min. - 4,2 gpm.
3	Working port flow rate 25 l/min. - 6,6 gpm.
4	Working port flow rate 45 l/min. - 11,8 gpm.
5	Working port flow rate 63 l/min. - 16,6 gpm.
6	Working port flow rate 95 l/min. - 25 gpm.

EACH SPOOL WILL BE SUPPLIED WITH THE CORRESPONDING POSITIONING KIT

STANDARD MAIN SPOOLS FOR - NL - CONTROLS

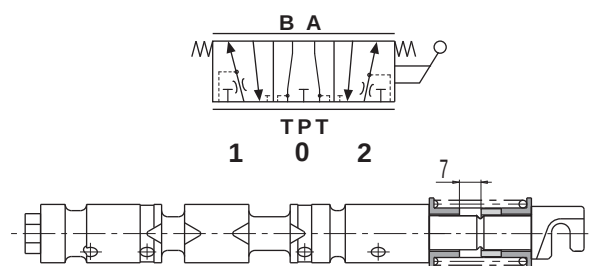
code 01

Double acting spool
(5 ways, 3 positions, A/B closed in neutral position)



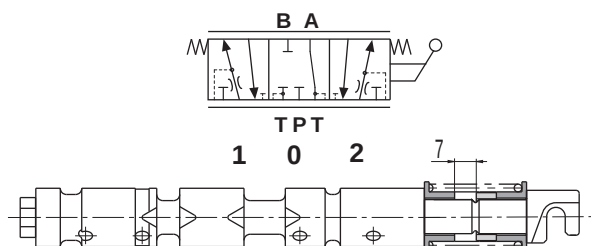
code 02

Motor spool
(5 ways, 3 positions, A/B → T in neutral position)



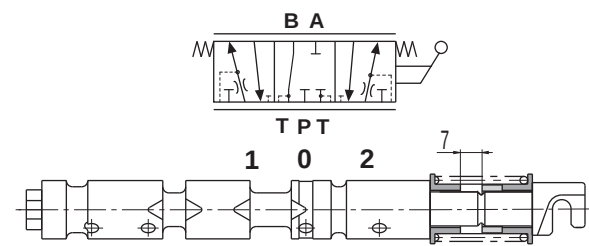
code 03

Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position)



code 04

Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position)



EO.241.0613.02.001M06



TYPE OF SPOOLS AVAILABLE

code 05

Single acting spool ("A" working port)
(5 ways, 3 positions, A/B closed in neutral position)

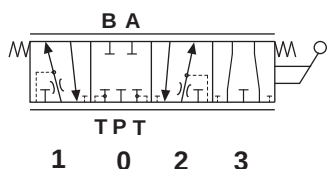
code 06

Single acting spool ("B" working port)
(5 ways, 3 positions, A/B closed in neutral position)

The choice to have a single acting spool must be done on the body of the valve with the plugs showed at page 12A
Therefore, for realizing spools code 05 and code 06 (single acting A or B) you need the spool code 01 in a circuit described at page 12A

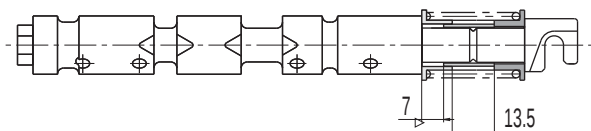
code 11

Double acting spool with float position
(5 ways, 4 positions, A/B closed in neutral position)



AVAILABLE ONLY WITH MANUAL CONTROL NL.
FLOAT POSITION CAN BE ACHIEVED ONLY PUSHING FORWARD THE LEVER.
THIS SPOOL CAN BE MOUNTED ONLY WITH LEVER ON "A" SIDE.

Before to order this code, please get in touch with our sales dept.



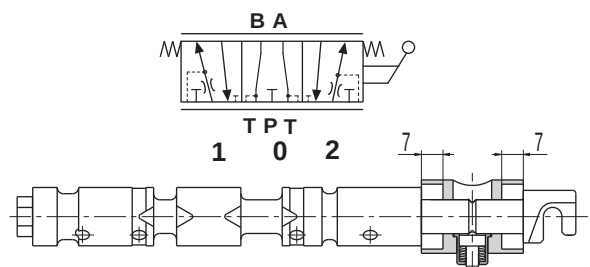
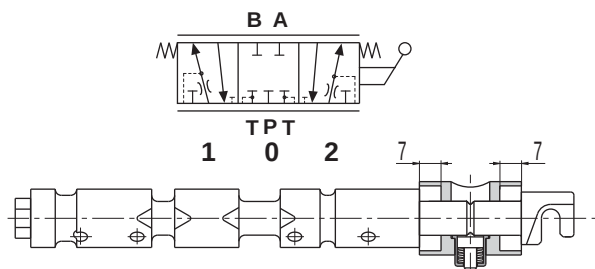
STANDARD MAIN SPOOLS FOR - FL - CONTROLS

code 01

Double acting spool
(5 ways, 3 positions, A/B closed in neutral position)

code 02

Motor spool
(5 ways, 3 positions, A/B → T in neutral position)

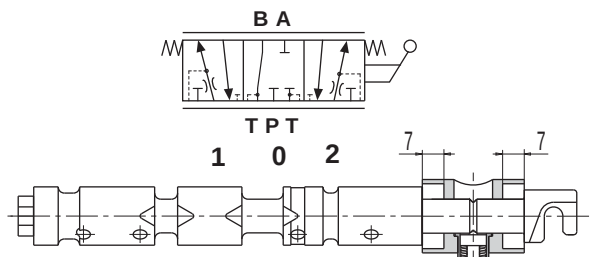
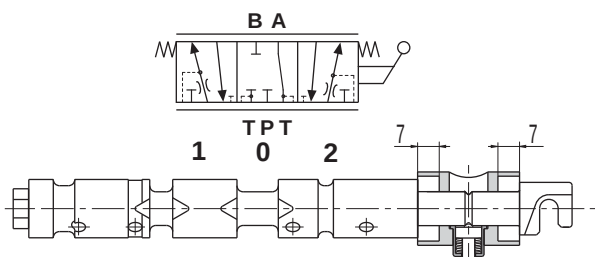


code 03

Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position)

code 04

Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position)



E0.241.0613.02.00IM06



TYPE OF SPOOLS AVAILABLE

code 05

Single acting spool ("A" working port)
(5 ways, 3 positions, A/B closed in neutral position)

code 06

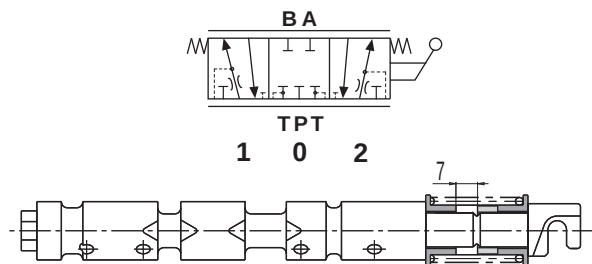
Single acting spool ("B" working port)
(5 ways, 3 positions, A/B closed in neutral position)

The choice to have a single acting spool must be done on the body of the valve with the plugs showed at page 12A
Therefore, for realizing spools code 05 and code 06 (single acting A or B) you need the spool code 01 in a circuit described at page 12A

STANDARD MAIN SPOOLS FOR - IP - CONTROLS

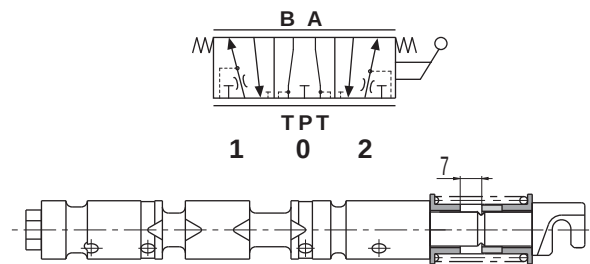
code 01

Double acting spool
(5 ways, 3 positions, A/B closed in neutral position)



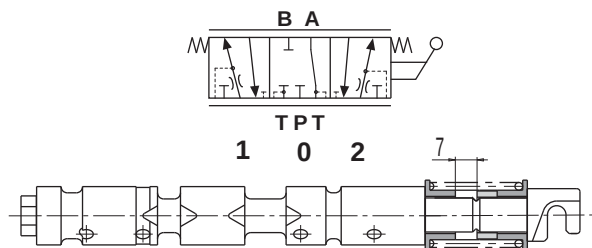
code 02

Motor spool
(5 ways, 3 positions, A/B → T in neutral position)



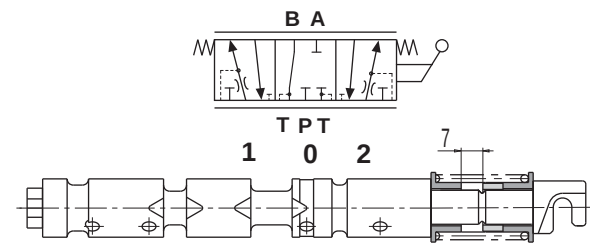
code 03

Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position)



code 04

Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position)



code 05

Single acting spool ("A" working port)
(5 ways, 3 positions, A/B closed in neutral position)

code 06

Single acting spool ("B" working port)
(5 ways, 3 positions, A/B closed in neutral position)

The choice to have a single acting spool must be done on the body of the valve with the plugs showed at page 12A
Therefore, for realizing spools code 05 and code 06 (single acting A or B) you need the spool code 01 in a circuit described at page 12A

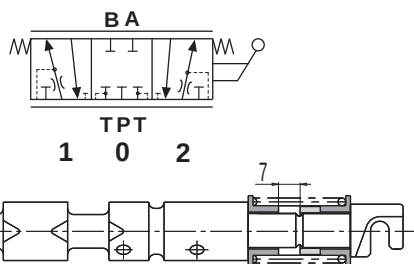


TYPE OF SPOOLS AVAILABLE

STANDARD MAIN SPOOLS FOR - PP-KE-KM - CONTROLS

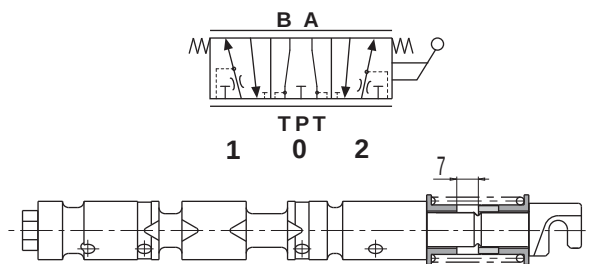
code 01

Double acting spool
(5 ways, 3 positions, A/B closed in neutral position)



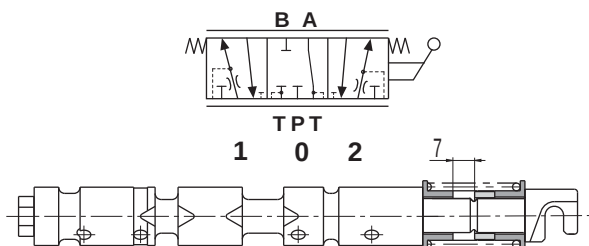
code 02

Motor spool
(5 ways, 3 positions, A/B → T in neutral position)



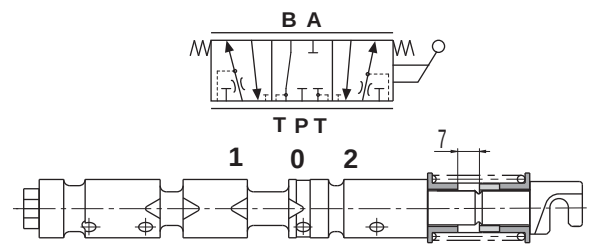
code 03

Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position)



code 04

Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position)



code 05

Single acting spool ("A" working port)
(5 ways, 3 positions, A/B closed in neutral position)

code 06

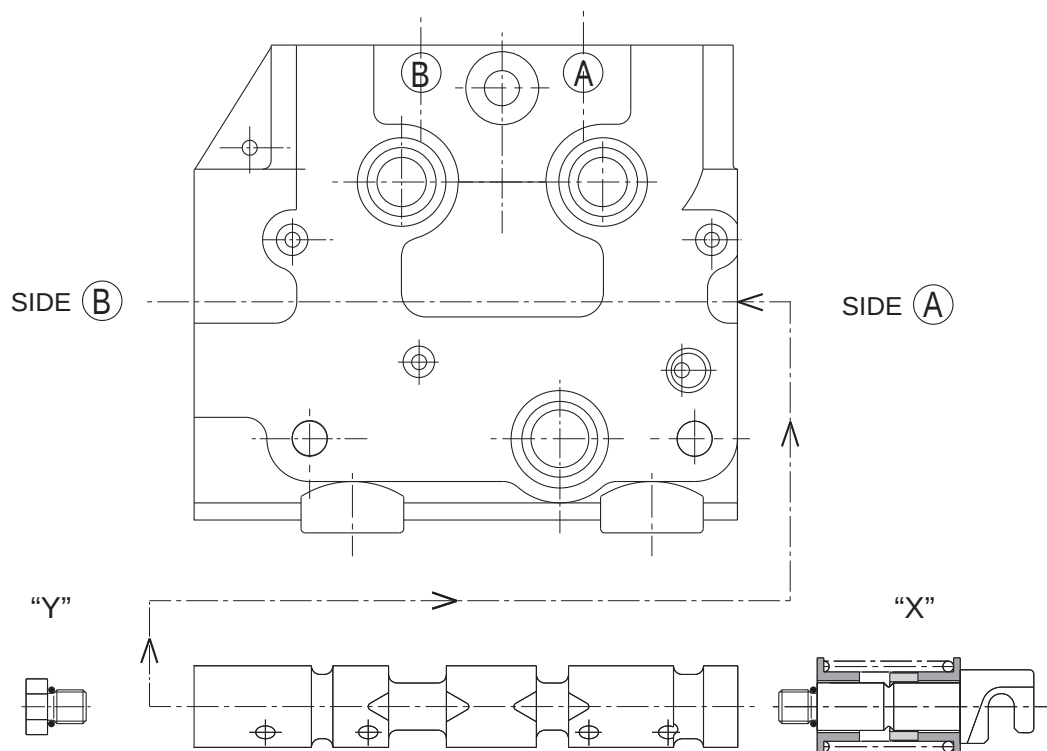
Single acting spool ("B" working port)
(5 ways, 3 positions, A/B closed in neutral position)

The choice to have a single acting spool must be done on the body of the valve with the plugs showed at page 12A. Therefore, for realizing spools code 05 and code 06 (single acting A or B) you need the spool code 01 in a circuit described at page 12A.



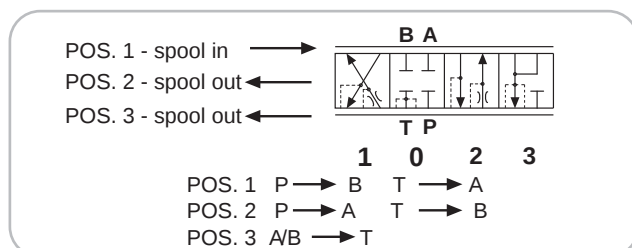
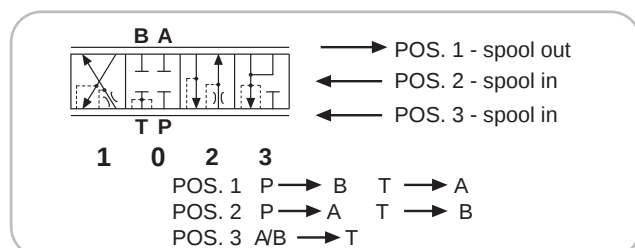
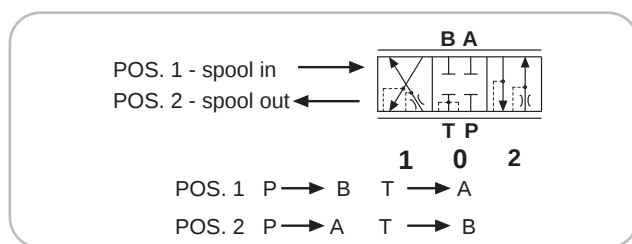
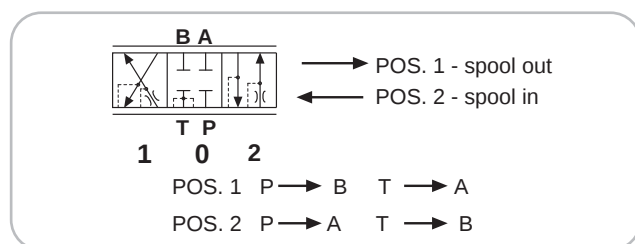
SPOOL CONTROL

GENERAL CAUTIONS FOR SPOOL CONTROL ASSEMBLING



GENERAL FEATURES

On this and following pages are shown in details all the spool controls available. All the spool control and positioning devices can be mounted on both (A) and (B) sides, taking care to introduce always the spool in the (A) to (B) side direction. Because spool end threads are identical we can fit "X" hook spring device and "Y" plug on both spool end sides.



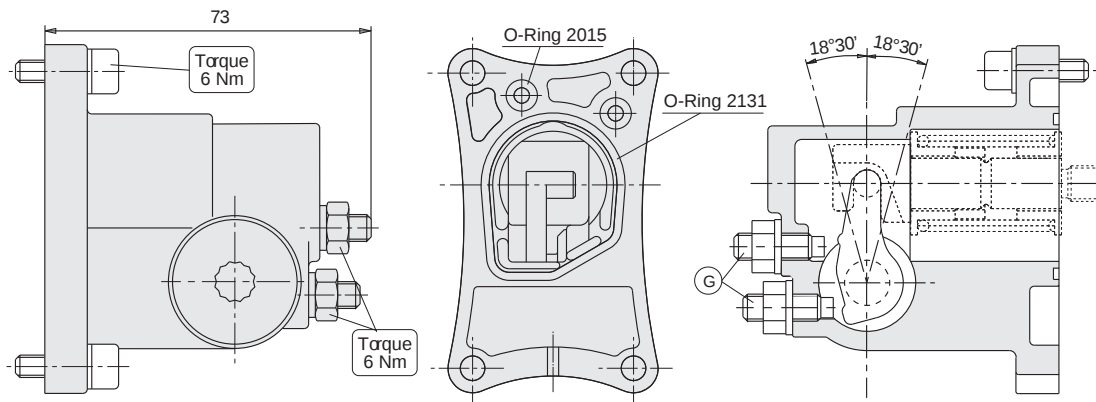
EO.241.0613.02.001M06



SPOOL CONTROL

SPS

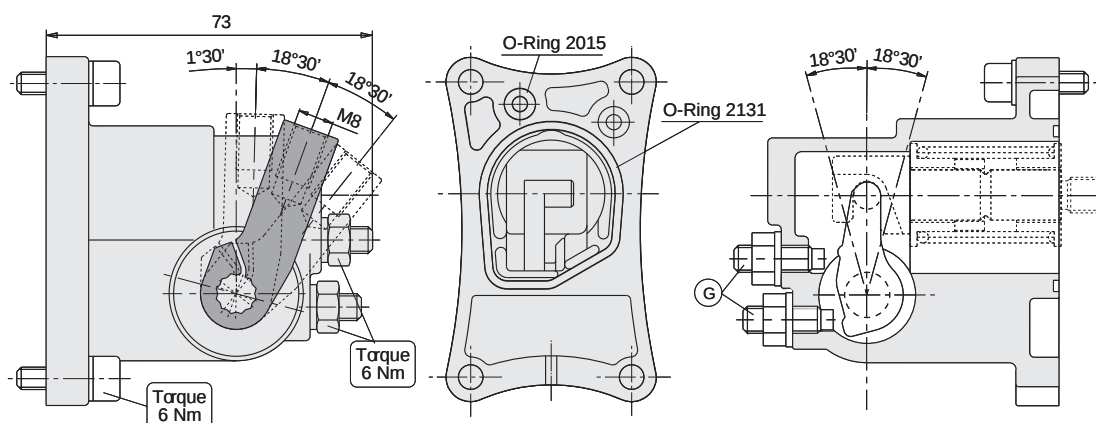
WITHOUT SHAFT SUPPORT



The code “ SPS “ is a spool positioning kit that can be used with spool controls “ PP-IP-KM “. The external adjusting screws “ G “ have to be used to reduced the spool stroke and consequently the port flow.

SL

WITH SHAFT SUPPORT (WITHOUT LEVER)



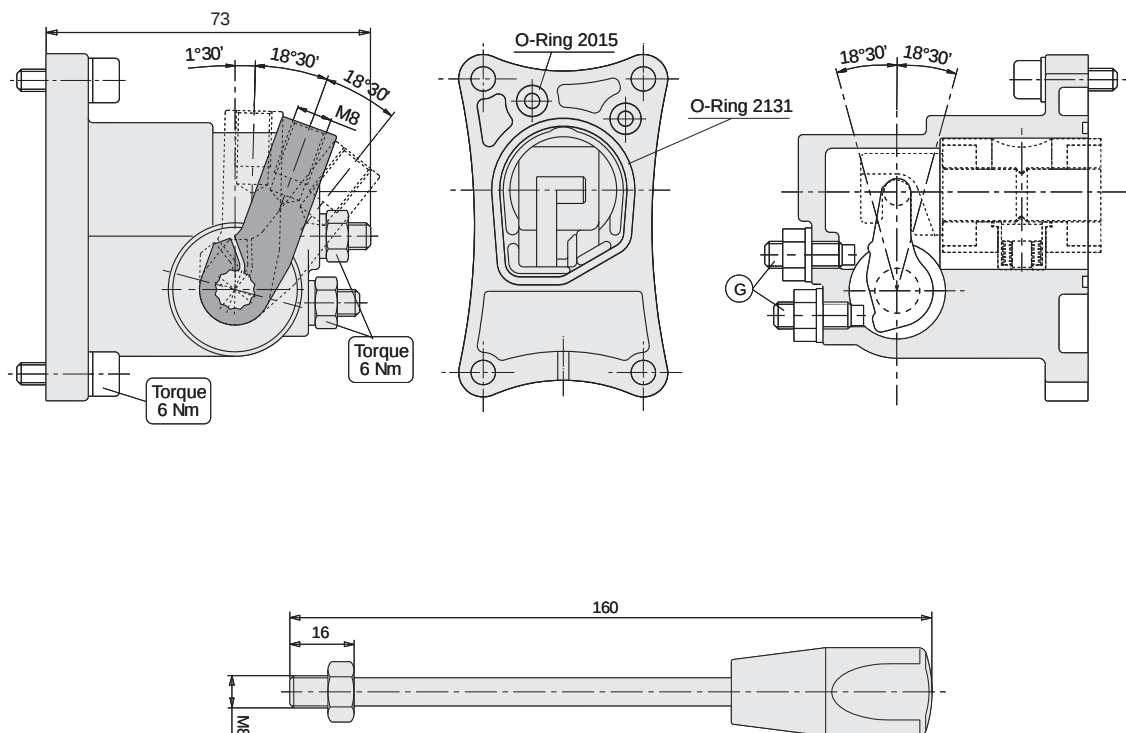
The code “ SL “ is the standard lever mechanism and can be used together with all spool controls. In case we have spool remote controls the “ SL “ device can be used as emergency lever. Also in this case the external adjusting screws “ G “ have to be used to reduced the spool stroke and consequently the port flow.

E0.241.0613.02.00IM06

SPOOL CONTROL

NL / FL

WITH LEVER



The code “NL” is the standard lever mechanism and can be used together with all spool controls. In case we have spool remote controls the “NL” device can be used as emergency lever. Also in this case the external adjusting screw “G” have to be used to reduce spool stroke and consequently port flow.

This device cannot be used with remote spool controls.

The code “FL” is a manual lever mechanism with friction detent built-in, this device has to be used with spools shown on page 20A

This device cannot be used with remote spool controls.

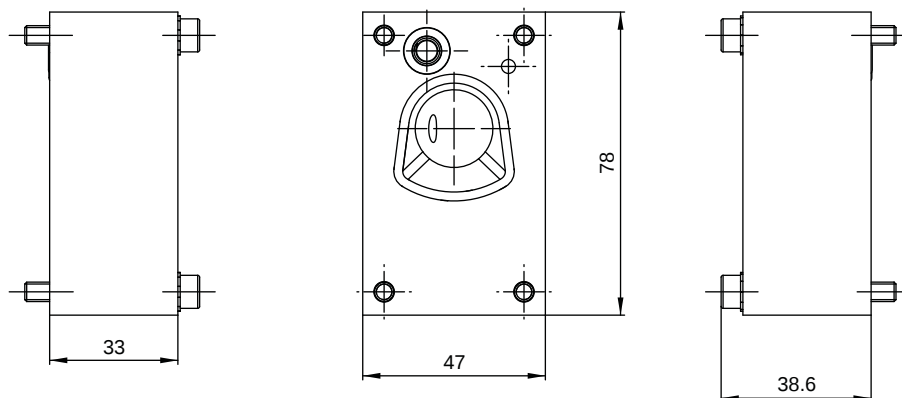
EO.241.0613.02.001M06



SPOOL CONTROL

C0 - C2

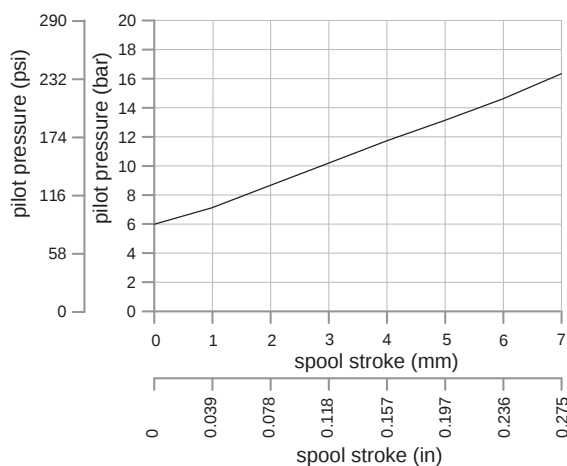
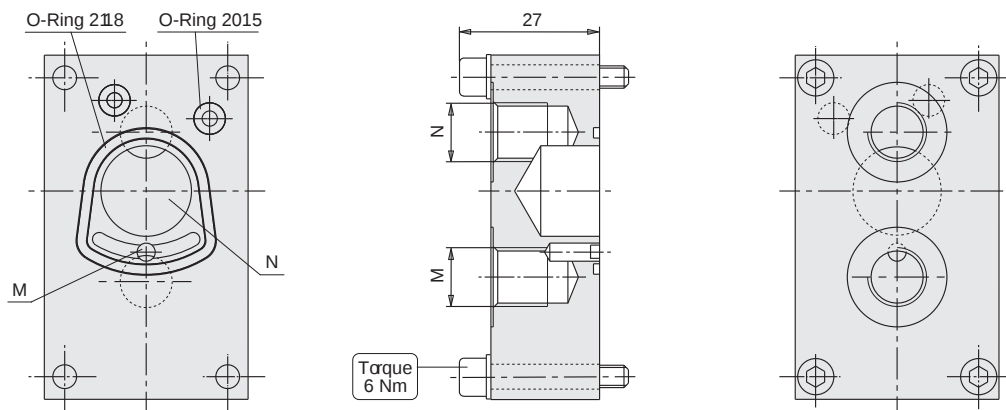
MANUAL CONTROL



The code “C2-CO” is a simple end plate used all the time we have “NL-FL” spool controls.

IP

HYDRAULIC PROPORTIONAL CONTROL



PORT SIZES	M - N
BSP ISO 228	G 1/4
SAE ISO 176	SAE4 7/16 - 20 UNF

The code “IP” is a hydraulic proportional spool control.
“M and N” are the pilot pressure ports.

For example if we fit the “IP” device on “A” side the pilot pressure going in “N” port push the spool to “B” side direction allowing pump flow through working port “A”. When we supply pilot pressure to “M” port we pull the spool to “A” side allowing pump flow through working port “B”.

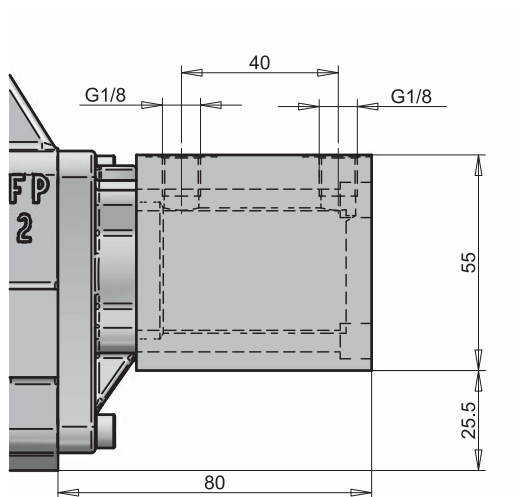
E0.241.0613.02.00IM06



SPOOL CONTROL

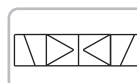
PP

PNEUMATIC PROPORTIONAL CONTROL



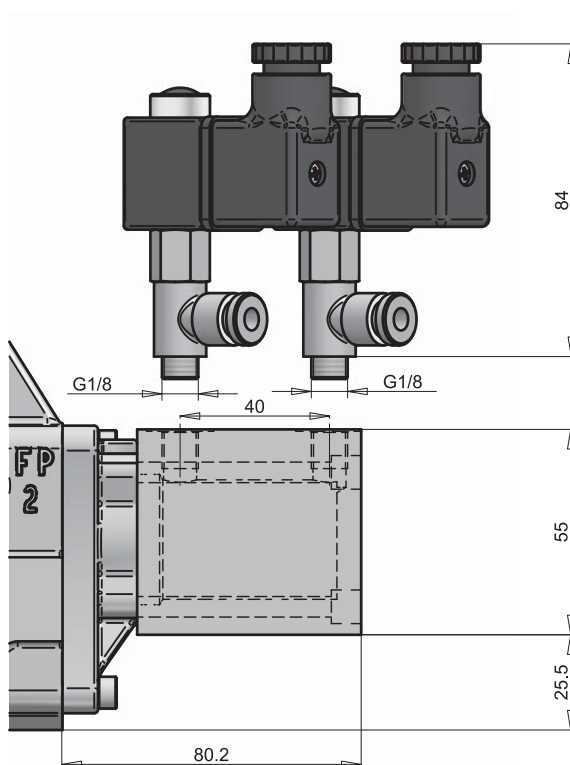
P1 - P2

ELECTRO-PNEUMATIC ON-OFF CONTROL



12 V.d.c. - code P1

24 V.d.c. - code P2

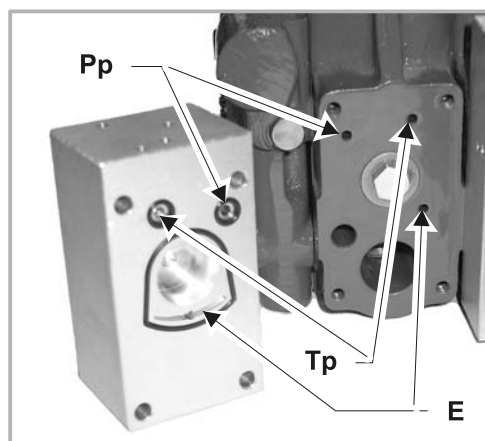
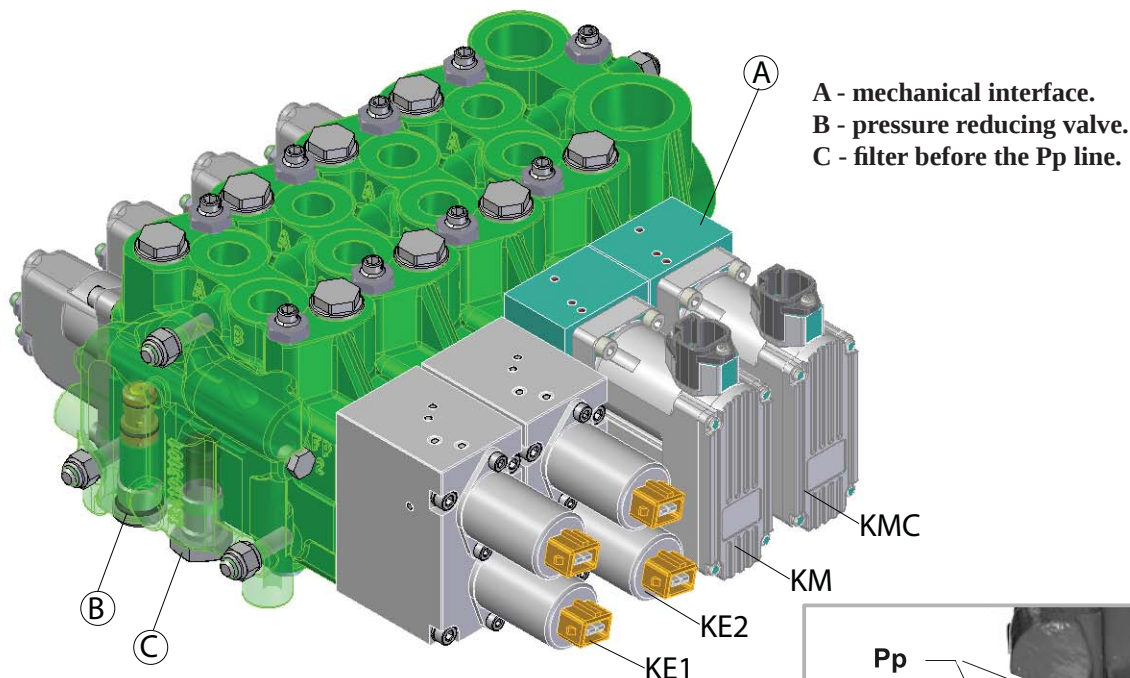


EO.241.0613.02.001M06



SPOOL CONTROL

ASSEMBLING COMPONENTS



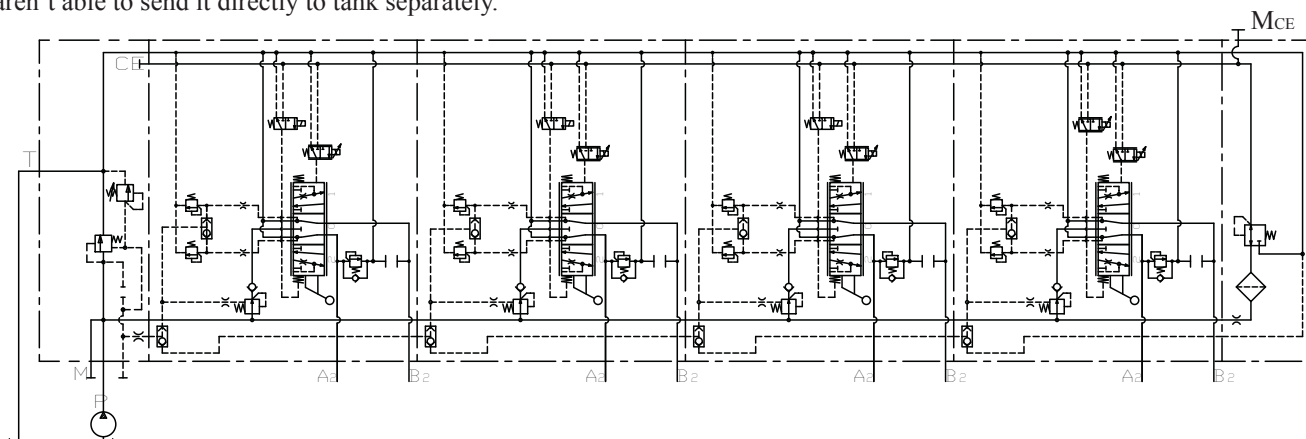
In this type of valve the piloting lines “Pp and Tp” are built-into the casting, for this reason we can assemble the pressure reducing valve “C”, and the filter “D” directly on the end cover.

Moreover VDP08 doesn't need of a servo-piston to slide the spool on the working positions, in this valve the Pp line acts directly on the area made by the spool diameter.

In order to send the Pp line at the other spool side, the casting is pre-arranged with the cavity “E”.

In this assembly the mechanical interfaces “A” need only to assemble the “KE1/KE2” rather than the “KM/KMC” on the VDP08 side.

With the actual working modules the Tp line goes into the main T line, we aren't able to send it directly to tank separately.



E0.241.0613.02.00IM06

SPOOL CONTROL

KE1 - KE2

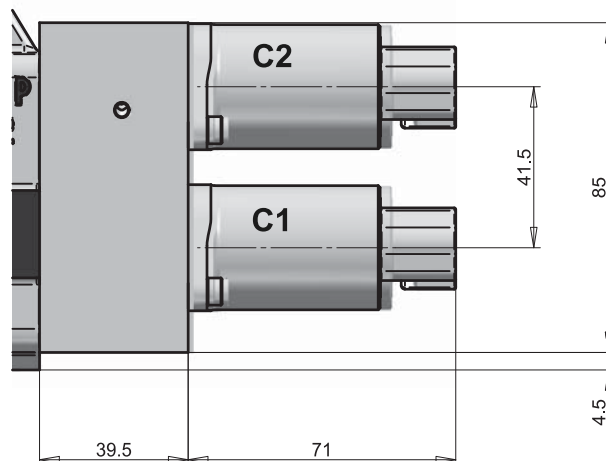
**ELECTRO-HYDRAULIC CONTROL (PROPORTIONAL / ON-OFF)
OPEN LOOP**

12 V.d.c. - code KE1

24 V.d.c. - code KE2

OPERATING INSTRUCTIONS
please see the hydraulic circuit.

Electrical Data		
Voltage	12V	24V
Current	1500 mA	750 mA
Resistance	4.72 $\Omega \pm 5\%$	20.8 $\Omega \pm 5\%$
Type of Control	Current Control PWM 100 Hz Recommended	



FUNCTIONAL SCHEME

C1 - C2 COILS DE-ENERGIZED => POS. 0
C1 COIL ENERGIZED => POS. 2
C2 COIL ENERGIZED => POS. 1

Hydraulic Data	
Max Pressure (P, T)	pP = 50 bar, pT = 30 bar
Hysteresis (w/ PWM)	< 0.7 bar (pA=20) < 1.0 bar (pA=25) < 1.5 bar (pA=35)
Filter Screen	125 μm
Contamination Level	Min Filtration: 20/18/15 According to ISO 4406
Fluid	Mineral Oil According to DIN 51524
Temperature Range Fluid	-40 to +105°C
Valve Specifications According to Thomas LHP-39	

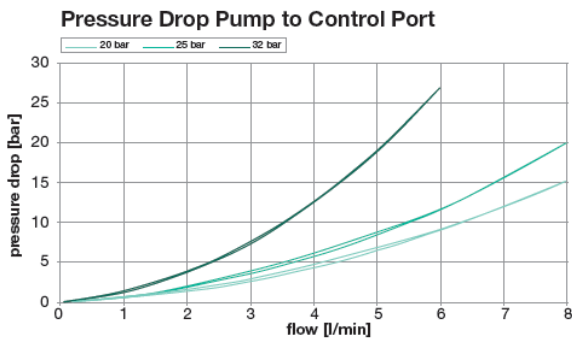
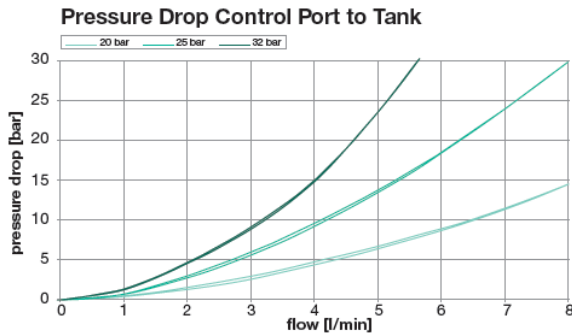
Features	Benefits
Integrated Relief Function	Protection Against Pressure Spikes
Compact Dimensions	Reduced Packaging Dimensions
Low Leakage	Lower Energy Losses
Precise Current vs Pressure Control	Excellent Controllability
Teflon Coated Bronze Bearings	Small Hysteresis, Improved Resolution
Excellent Repeatability	No Calibration Over The Lifetime of The Machine
Highest Quality Standards	No Maintenance, No Downtime
Small Valve to Valve Variance	Easy Replacement, No Service Calibration

EO.241.0613.02.001M06



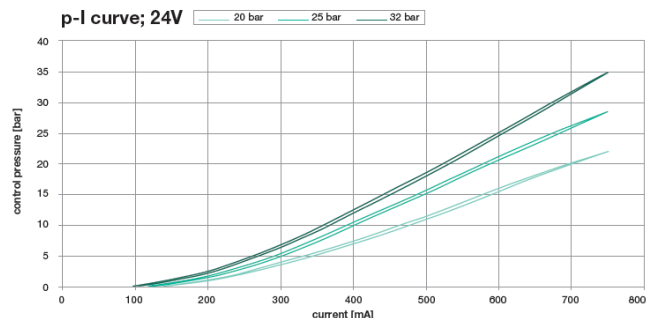
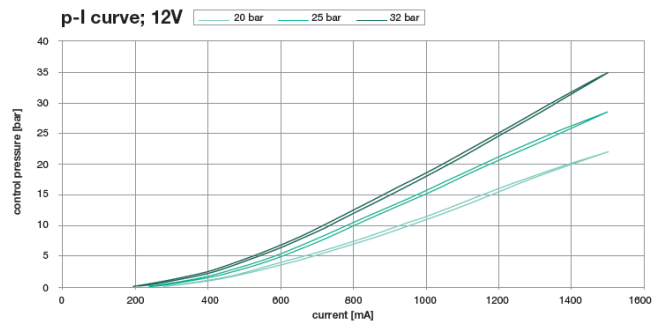
SPOOL CONTROL

Flow Characteristics



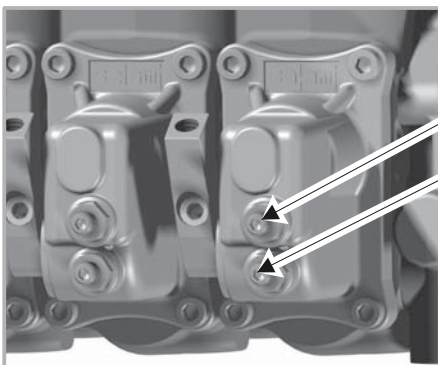
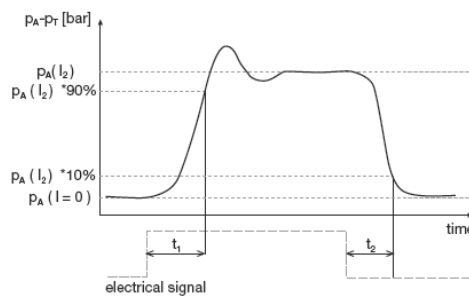
Current vs. Pressure

Less than 2% Hysteresis



Step Response

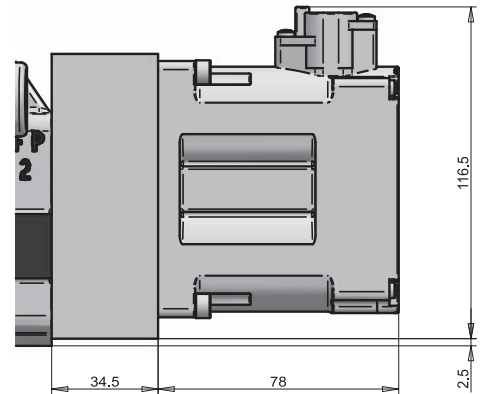
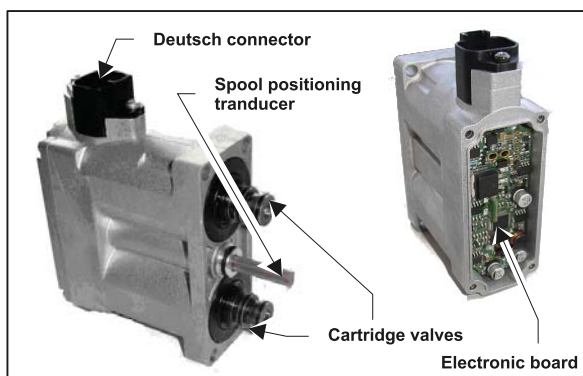
(50°C Oil Temperature) $t_1, t_2 < 50$ ms



In the VDP08 assembling the electronic spool positioning slides together in axis with the spool.

In order to adjust the flow with accuracy, we can reduce the spool stroke with the registers showed on the left. In this case we are able to re-set the electronic board parameters to optimize the voltage signal with the new spool strokes. The working diagram beside shows the comparison between the voltage signal and the standard spool stroke.

E0.241.0613.02.00IM06

SPOOL CONTROL**KM - KMC****ELECTRONIC-HYDRAULIC CONTROL (PROPORTIONAL)
CLOSED LOOP****ANALOGIC - code KM****CAN BUS - code KMC****CLOSED-LOOP ELECTRONIC-HYDRAULIC PROPORTIONAL ACTUATOR**

The KM proportional actuator is designed to control the stroke of the main spool of the Salami directional control valve in response to a control signal. The control signal can be provided by an analog voltage source (e. g. a potentiometer) or the module can be integrated in a digital control environment.

The KM carries its function by controlling the currents of two proportional electrovalves and by measuring the spool position by means of an Hall effect linear transducer. This internal closed-loop position control makes the valve spool achieve the desired position with accuracy levels approaching the performance of a servo-valve.

The KM may shift the valve spool either directly (VDP08 version) or by means of a servo-position mechanically connected to it.

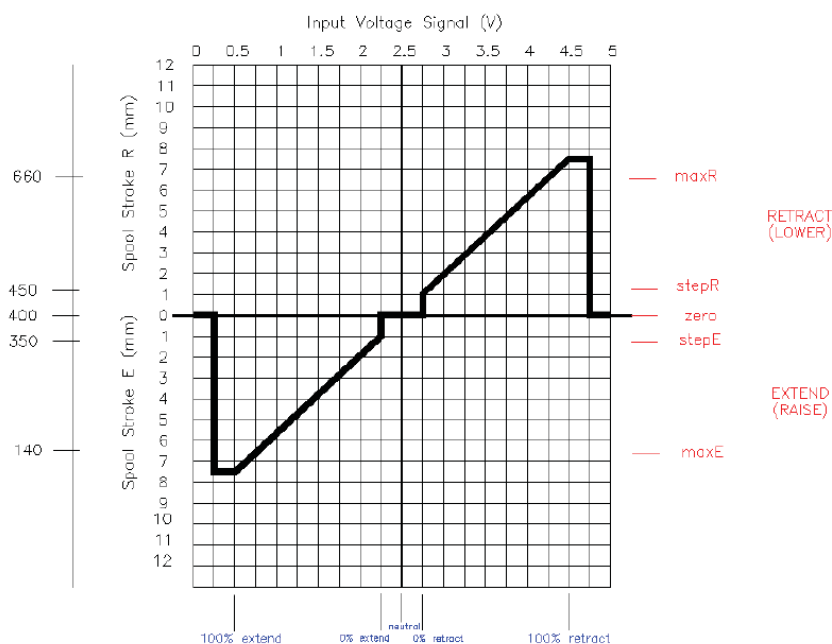
In a CAN bus operating mode, the remote control set point is processed via CAN bus according to ISO 11898 at 250 kbit/s by means of address-based (SAE J1939) or message-based (CAN 2.0B) protocols .

The microprocessor-based digital control of inherent functions (response time, flow rate presetting and spool position recovery after cut-off) makes it possible to adjust relevant parameters like PWM and DITHER frequencies, feedback algorithm during motion and under varying operative conditions (temperature changes, varying flow forces and off-set conditions of any kind) through a continuous teach-in process that will then maintain said parameters at their optimum level throughout the operative phase.

EO.241.0613.02.001M06



SPOOL CONTROL

**Remarks:** Input Signal :

Neutral position on 2,5VDC - MAX stroke A at 4,5 VDC - MAX stroke B at 0,5 VDC

Neutral Position Dead Band from 2,25 to 2,75 VDC.

Signal cut-off is triggered at < 0,25V and > 4,75V

Dead band in neutral	±0. 5mm
Step from neutral	±1 mm

Hydraulic Specifications

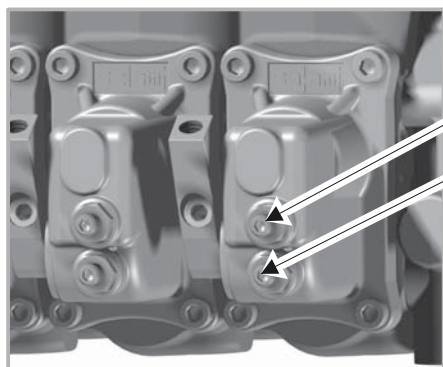
Max. spool stroke (each side):	8.5 mm up to 13.5 mm on "float"
Max. supply pressure:	35 bar
Min. supply pressure:	12 bar
Max. retrain line pressure:	5 bar
Pilot flow requirement:	0.2 lt/min
Oil temperature range:	-20 / + 95°C
Oil viscosity range:	3-650 cSt
Filtration:	18/15 (ISO 4406)
Weight	1.1 kg

Response time:	Neutral to max: < 180 ms
	Max to Neutral: < 250 ms

Electrical Specifications

Operating voltage:	8-30 VDC
Max current consumption:	750 mA/section
Operating temperature:	-20 / + 95°C
Analog Input impedance	>40 Kohm
Control pot. configuration:	3-pins
Typical control pot. resistance:	1-10 Kohm
Analog input signal (D/A version) :	0-5V
CAN bus interface (D/C version) :	ISO 11898
Environmental protection:	IP 68
EMC characteristics	ISO 7637

Resolution:	+/- 0.06 mm
Ramp time:	0 to 5 sec.



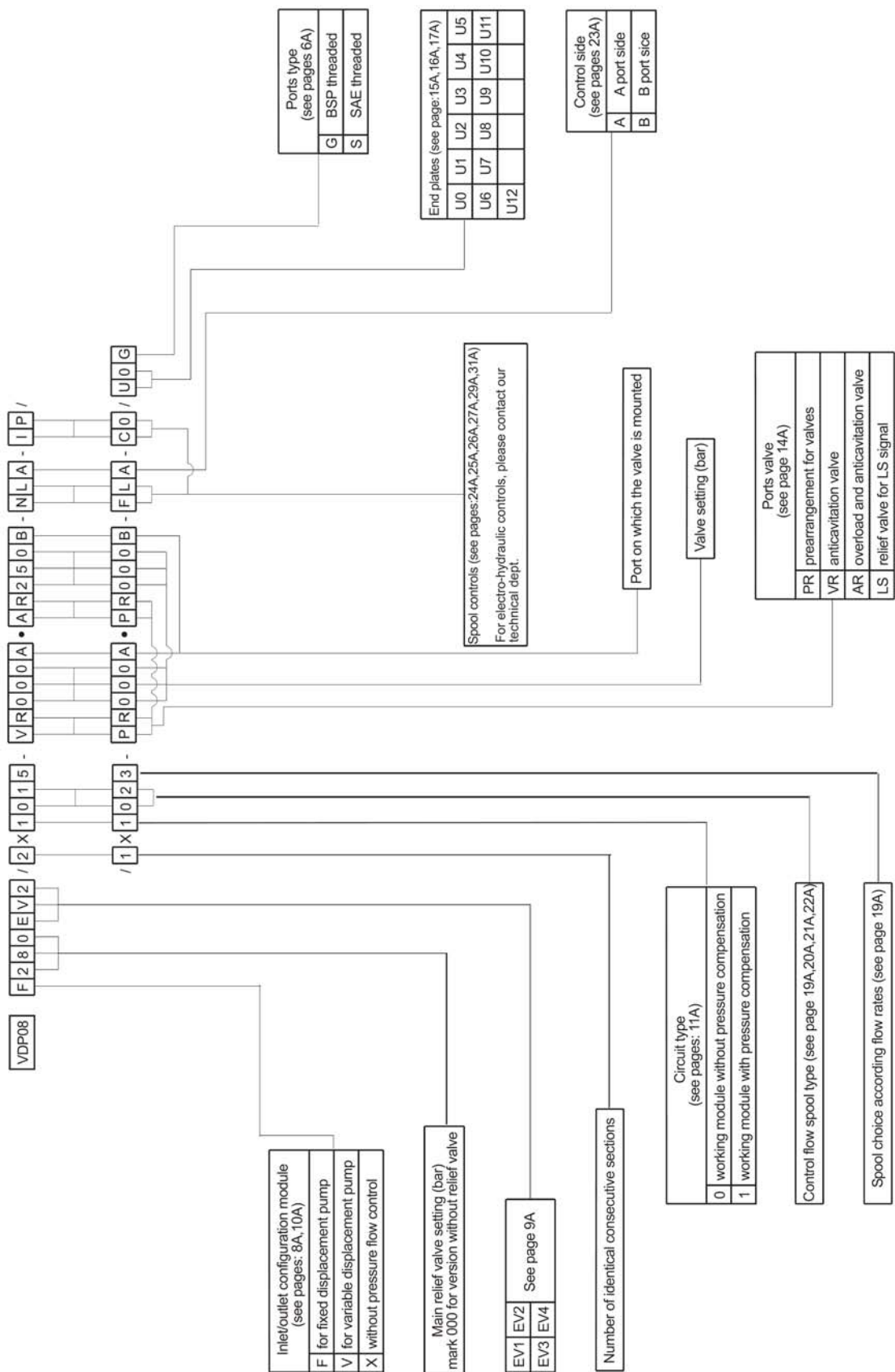
In the VDP08 assembling the electronic spool positioning slides together in axis with the spool.

In order to adjust the flow with accuracy, we can reduce the spool stroke with the registers showed on the left. In this case we are able to re-set the electronic board parameters to optimize the voltage signal with the new spool strokes. The working diagram beside shows the comparison between the voltage signal and the standard spool stroke.

E0.241.0613.02.00IM06



HOW TO ORDER



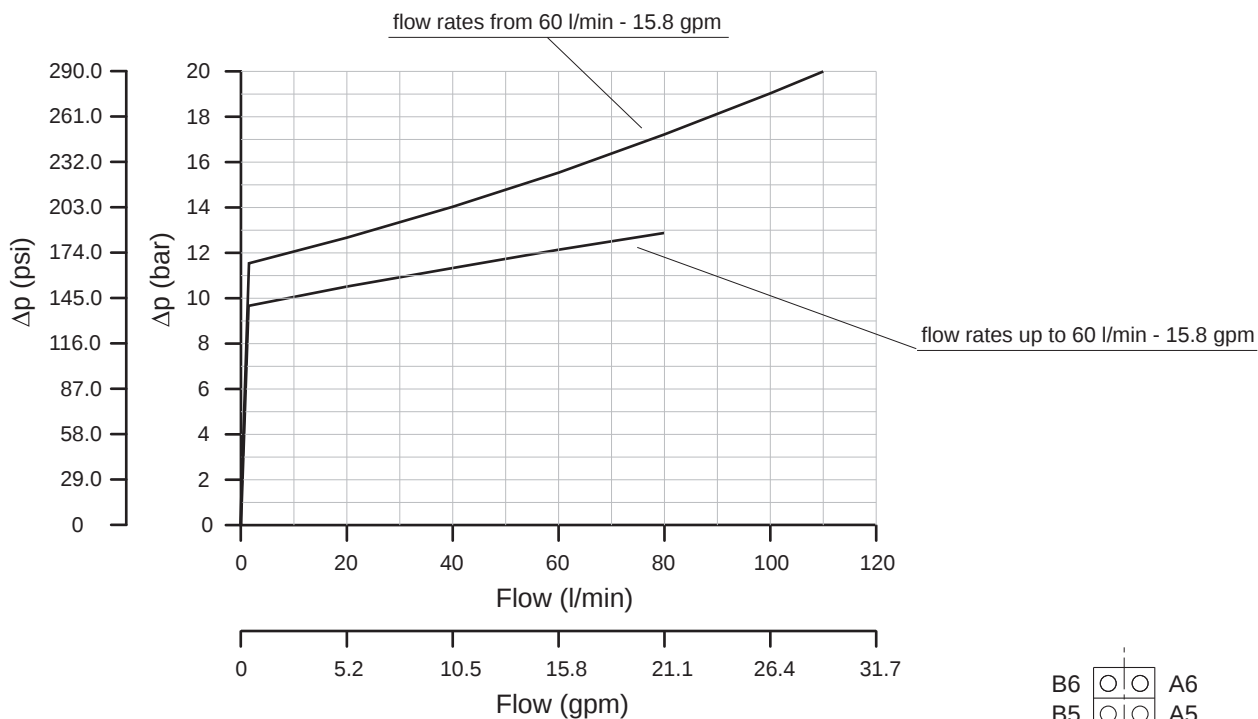
EO.241.0613.02.001M06



TECHNICAL DATA

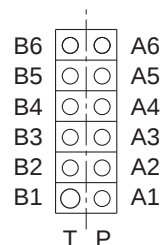
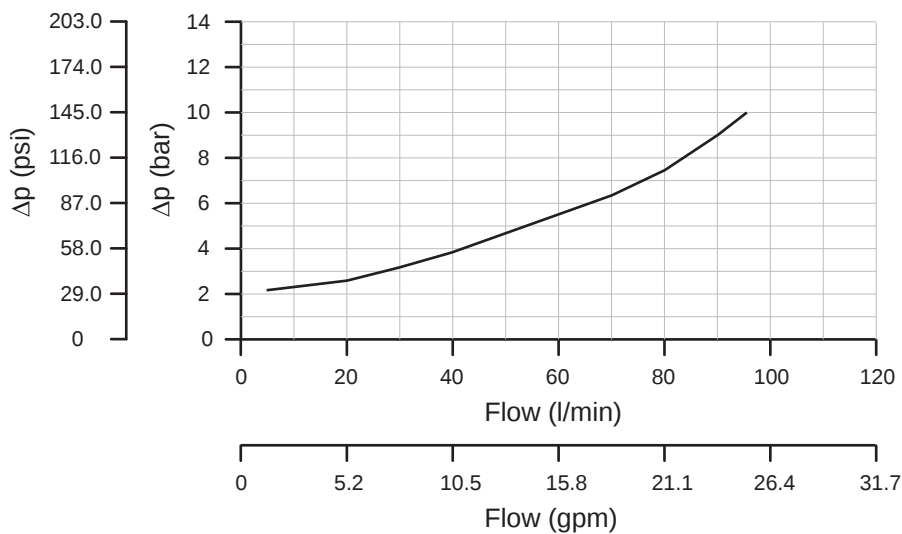
All the characteristics are measured using a mineral oil with a viscosity of
15 mm²/sec at a temperature of 60° C (140°F)

OPEN CENTER - NEUTRAL FLOW PRESSURE INLET/OUTLET MODULE



CLOSED CENTER - WORKING MODULES PRESSURE DROP

P → A3/B3



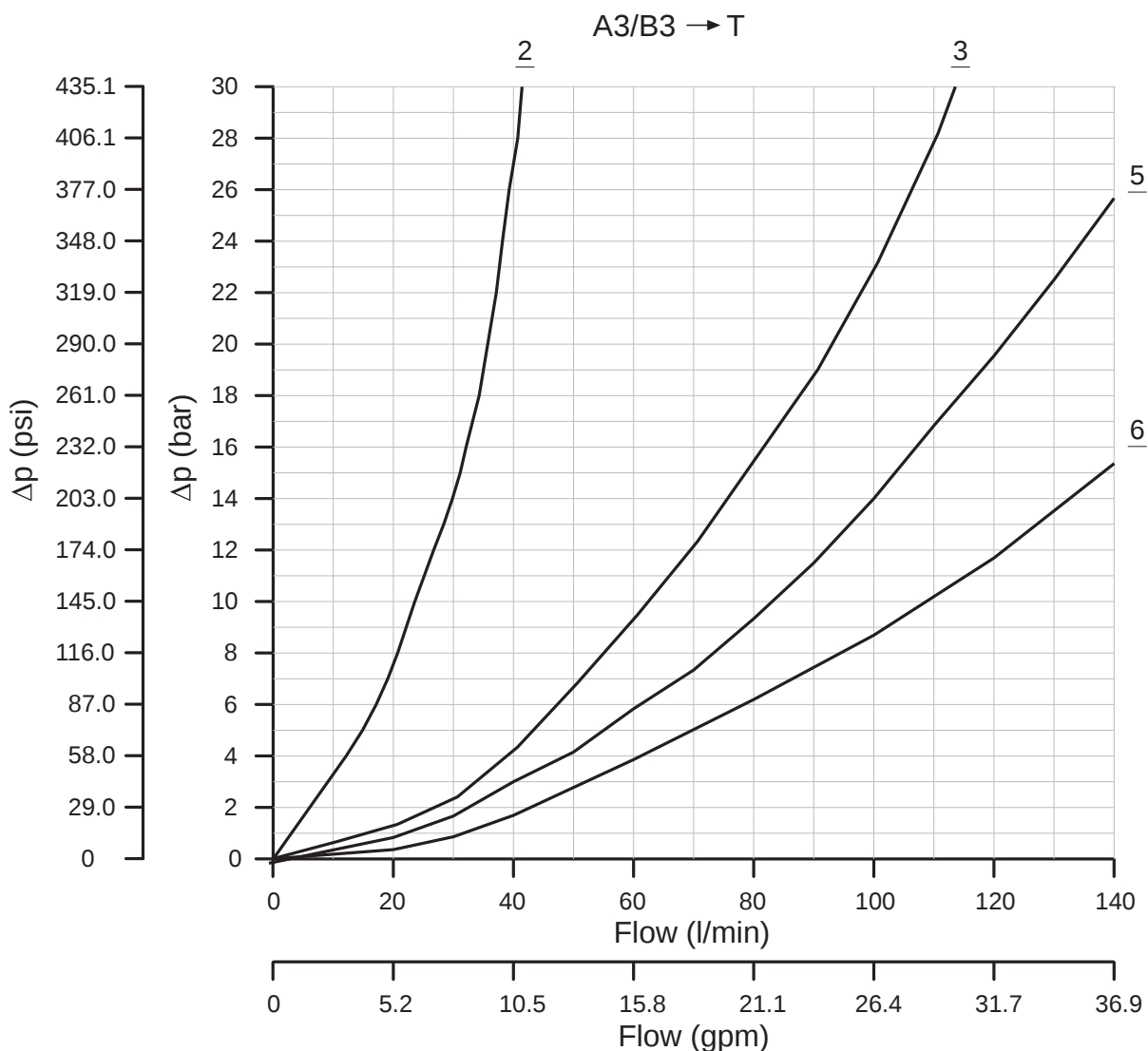
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TECHNICAL DATA

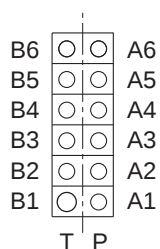
All the characteristics are measured using a mineral oil with a viscosity of
15 mm²/sec at a temperature of 60° C (140°F)

WORKING MODULES PRESSURE DROP FROM A/B TO T



SPOOLS (page 19A...)

Type Mod.
1
2
3
4
5
6



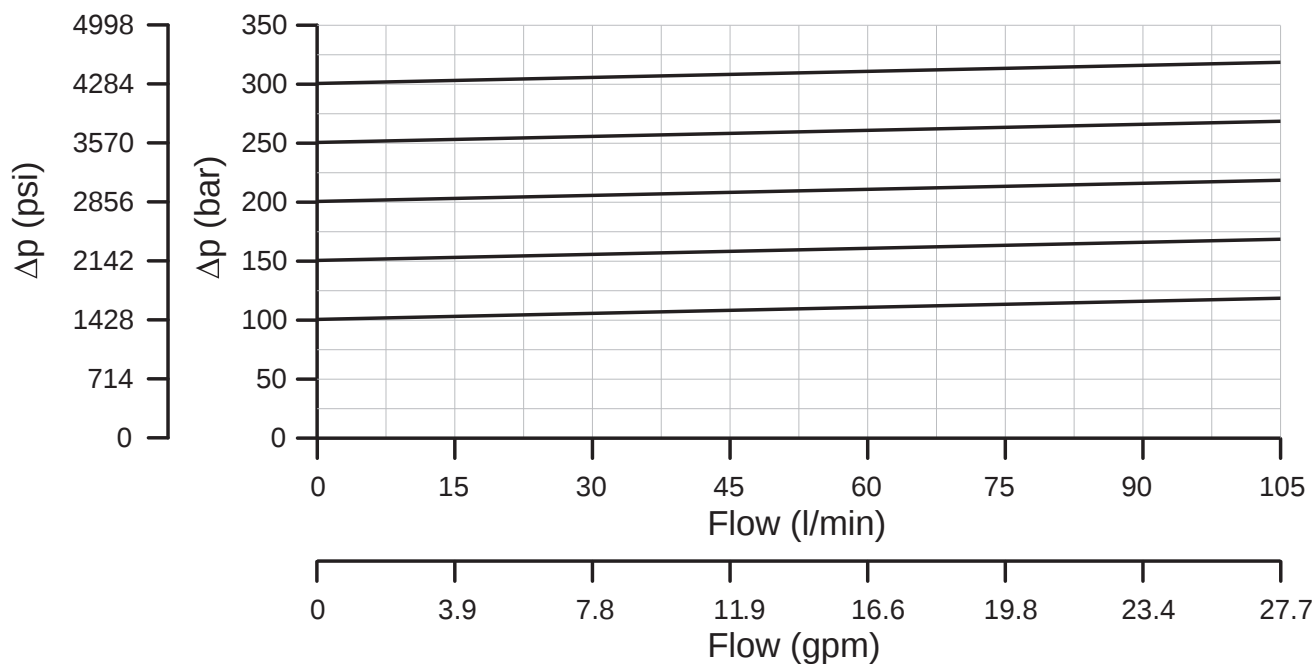
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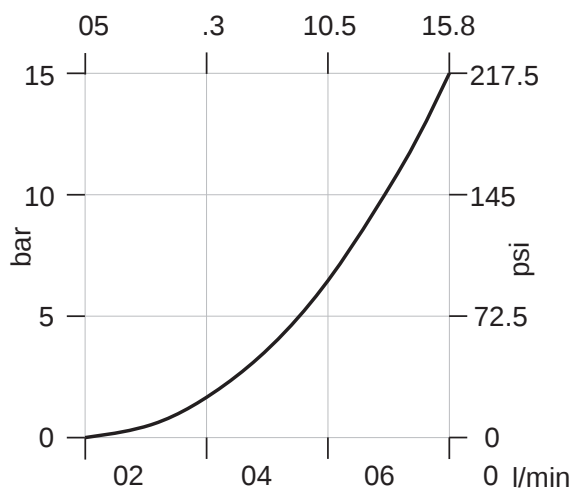
TECHNICAL DATA

All the characteristics are measured using a mineral oil with a viscosity of
15 mm²/sec at a temperature of 60° C (140°F)

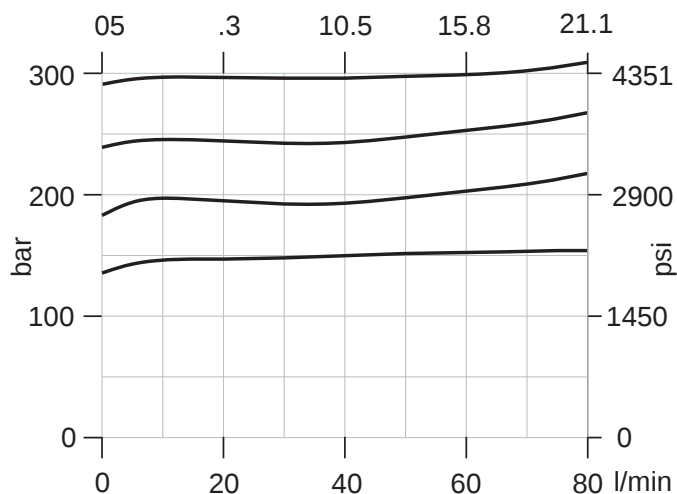
ADJUSTABLE PILOTED MAIN RELIEF VALVE



VR - Anti-cavitation valve (page 14 A)
US gal./min



AR - Overload and anti-cavitation valve (page 14 A)
US gal./min

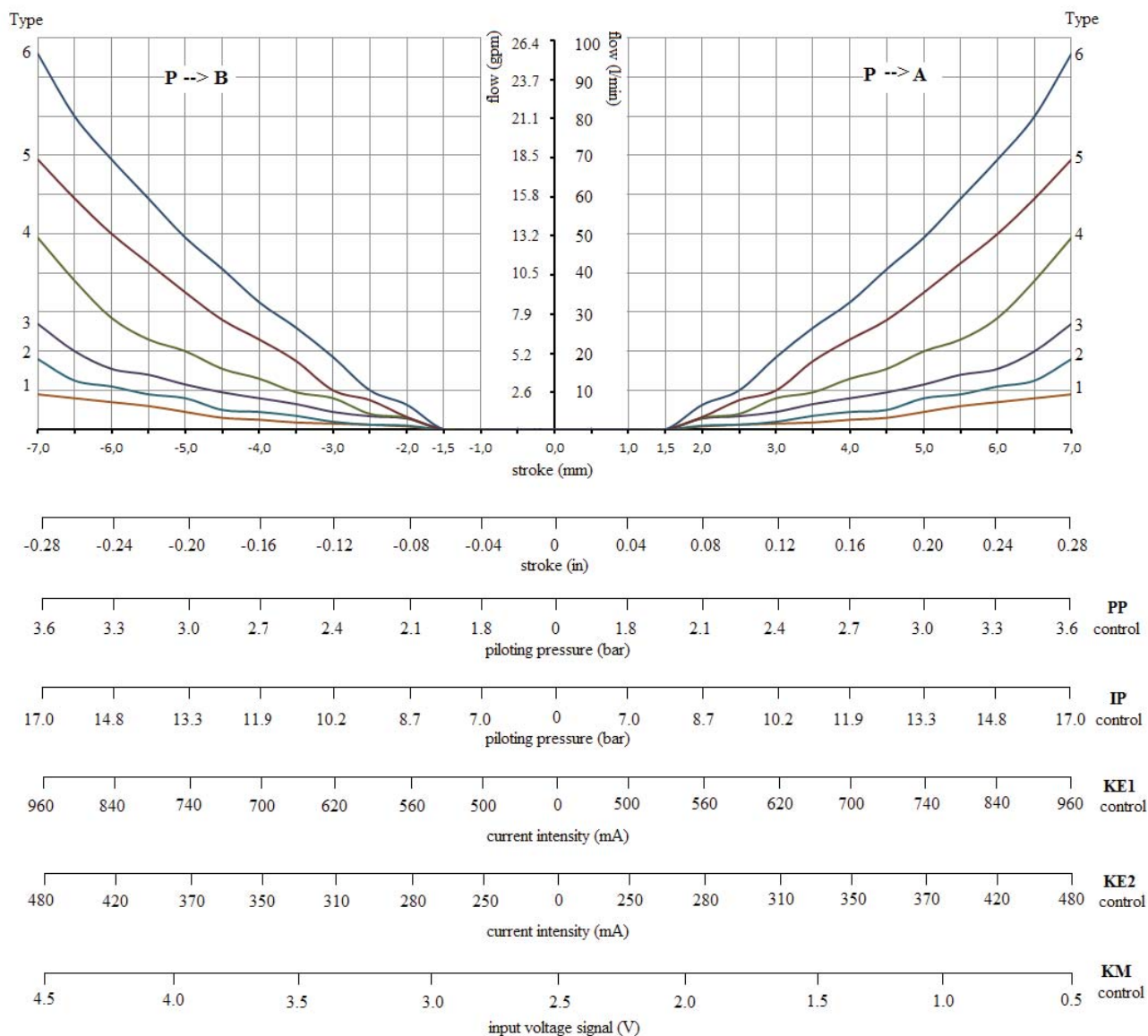


E0.241.0613.02.00IM06



TECHNICAL DATA

MEETERING CHARACTERISTICS WITH AVAILABLE CONTROLS



All the characteristics are measured using a mineral oil with a viscosity of 15 mm²/sec at a temperature of 60° C (140°F)

INLET FLOW = 130 l/min (34 GPM)

EO.241.0613.02.001M06



VDP08

**DIRECTIONAL CONTROL VALVE
PRESSURE COMPENSATED**

NOTES

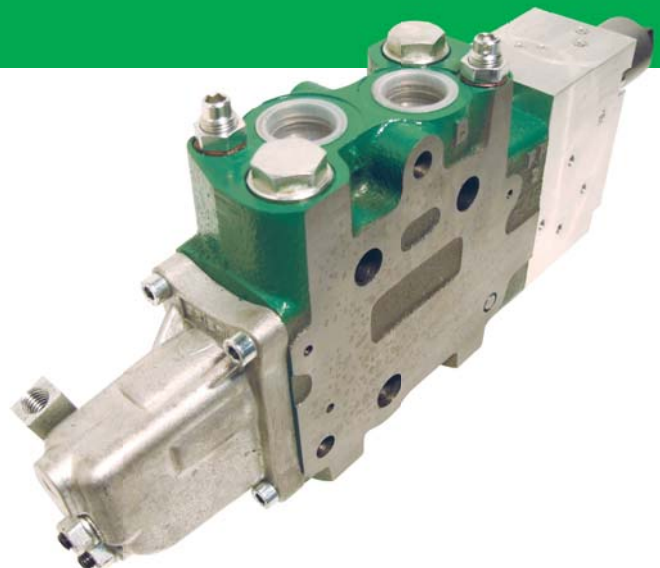
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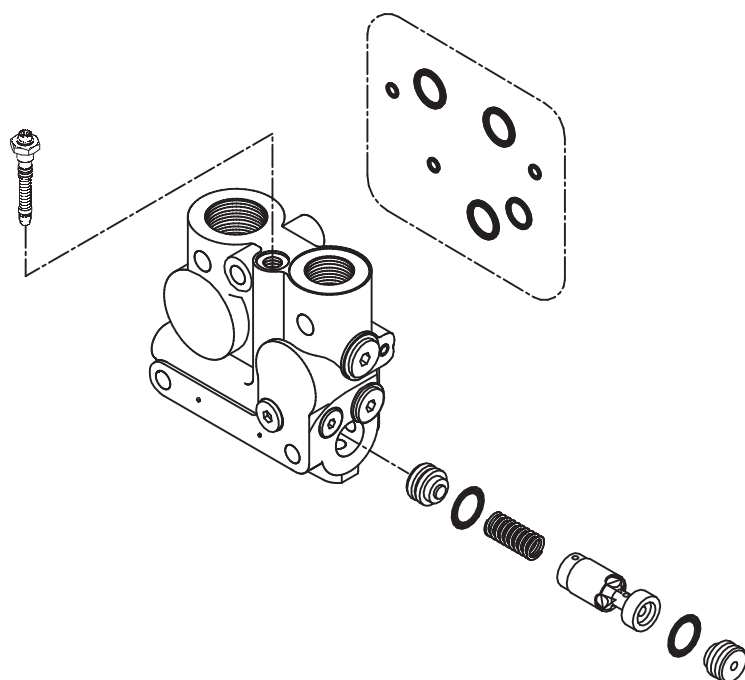
VDP08

Load-Sense Proportional Pressure Compensated Valve

SECTION B - Dealer - Spare Parts



INLET MODULE

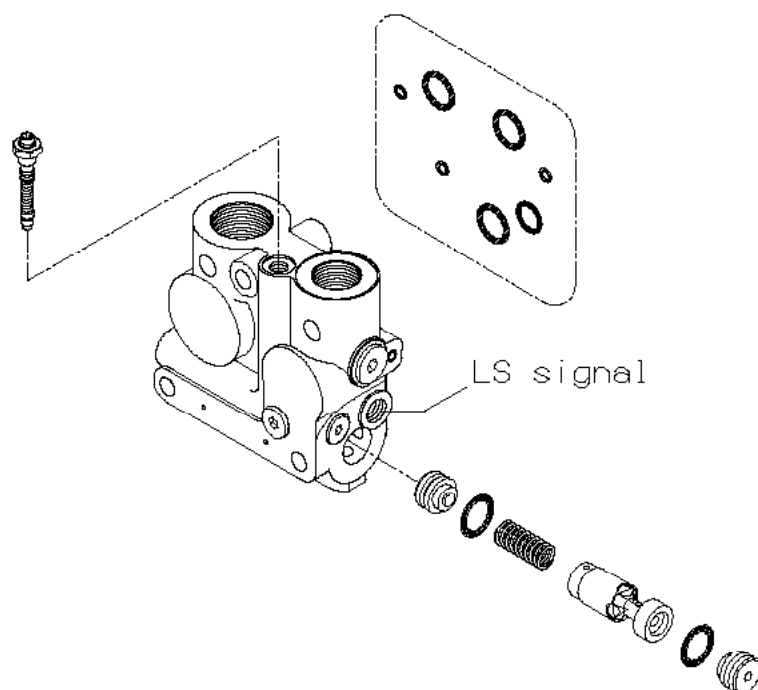


**OPEN CENTER (F)
for fixed displacement pumps**



**Trasformation kit OPEN CENTER (F)
Code R241 7013 0**

Part number R241 7801 0	Part number R241 7802 0
Commercial Part number F250-G	Commercial Part number F250-S



**CLOSED CENTER (V)
for variable displacement pumps**

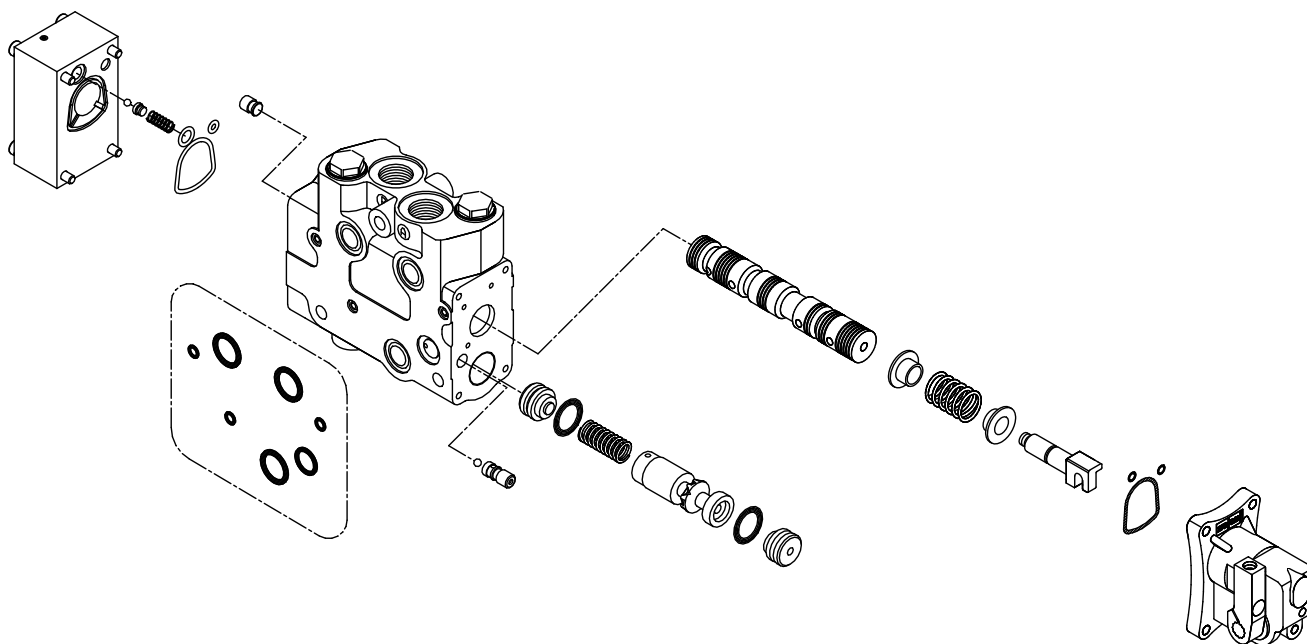


**Trasformation kit CLOSED CENTER (V)
Code R241 7012 0**

Part number R241 7803 0	Part number R241 7804 0
Commercial Part number V250-G	Commercial Part number V250-S

E0.241.0613.05.001M01

WORKING SECTION

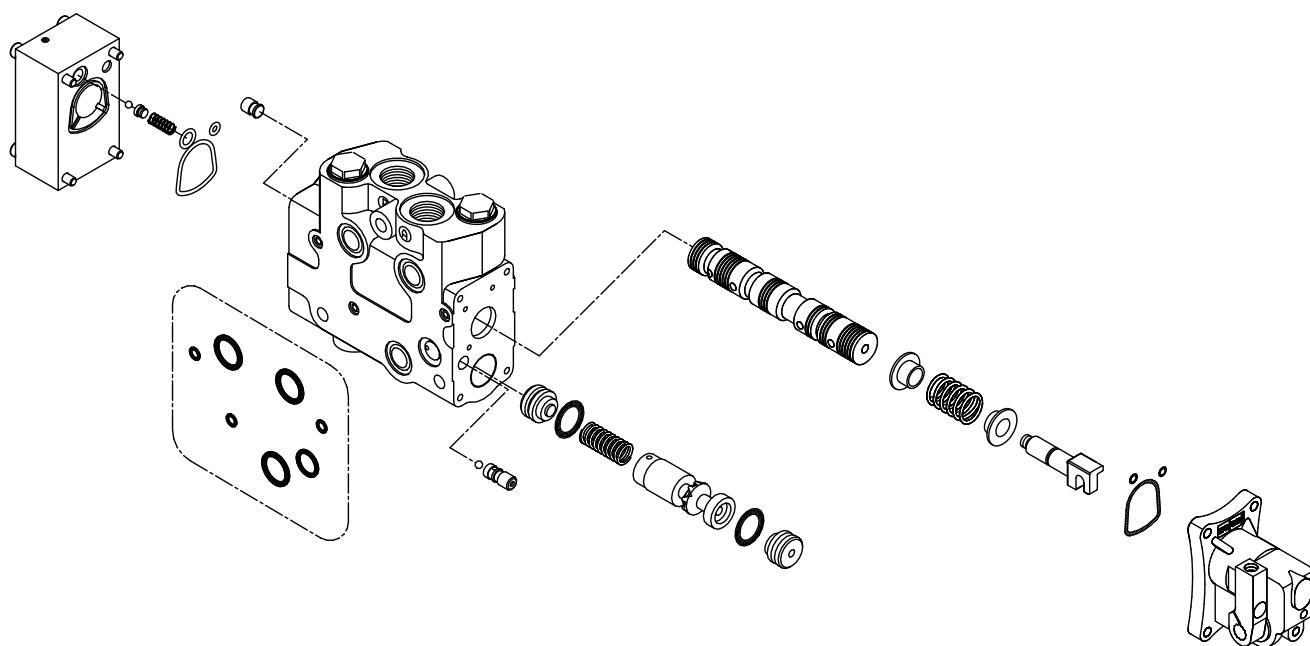
MANUAL CONTROL GAS
PR VALVES

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180010	8 l/min.	1011-PRA.PRB-NLA-C2/G	G1/2
S24180020	16 l/min.	1012-PRA.PRB-NLA-C2/G	G1/2
S24180030	25 l/min.	1013-PRA.PRB-NLA-C2/G	G1/2
S24180040	45 l/min.	1014-PRA.PRB-NLA-C2/G	G1/2
S24180050	63 l/min.	1015-PRA.PRB-NLA-C2/G	G1/2
S24180060	95 l/min.	1016-PRA.PRB-NLA-C2/G	G1/2

E0.241.0613.05.00IM01

WORKING SECTION

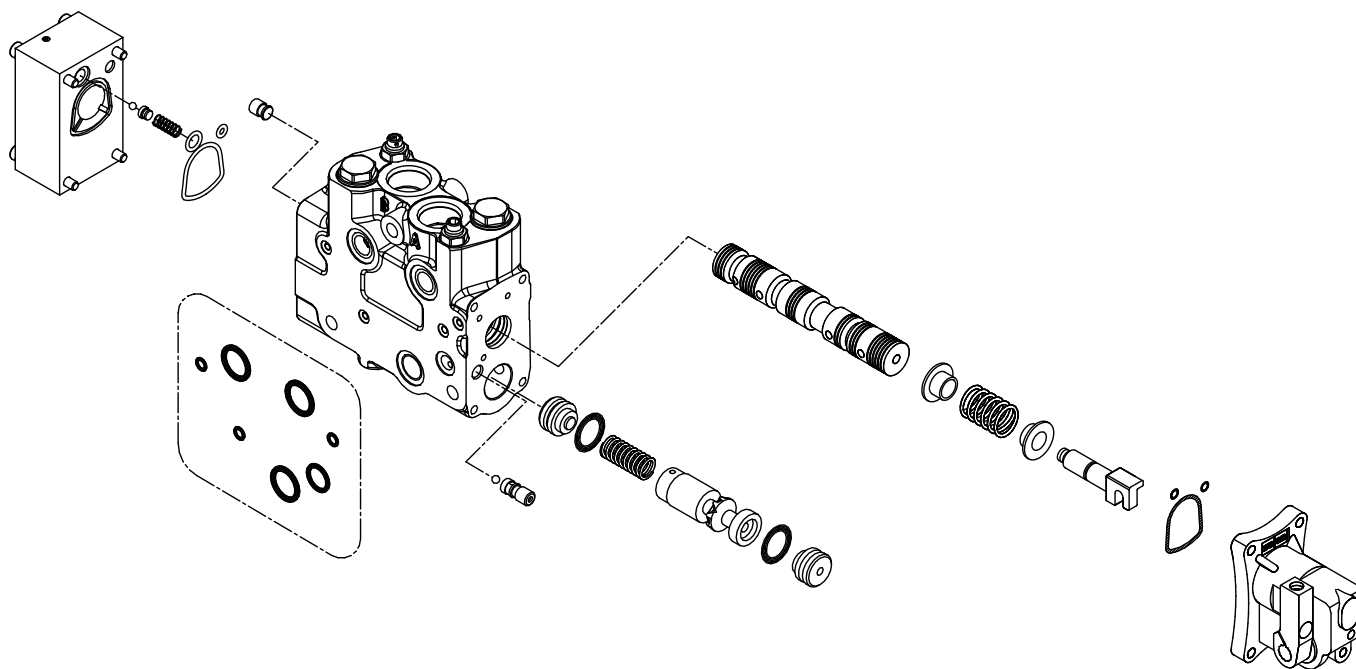
**MANUAL CONTROL SAE
PR VALVES**



PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180070	2,1 gpm.	1011-PRA.PRB-NLA-C2/S	SAE10
S24180080	4,2 gpm.	1012-PRA.PRB-NLA-C2/S	SAE10
S24180090	6,6 gpm.	1013-PRA.PRB-NLA-C2/S	SAE10
S24180100	11,8 gpm.	1014-PRA.PRB-NLA-C2/S	SAE10
S24180110	16,6 gpm.	1015-PRA.PRB-NLA-C2/S	SAE10
S24180120	25 gpm.	1016-PRA.PRB-NLA-C2/S	SAE10

E0.241.0613.05.001M01

WORKING SECTION

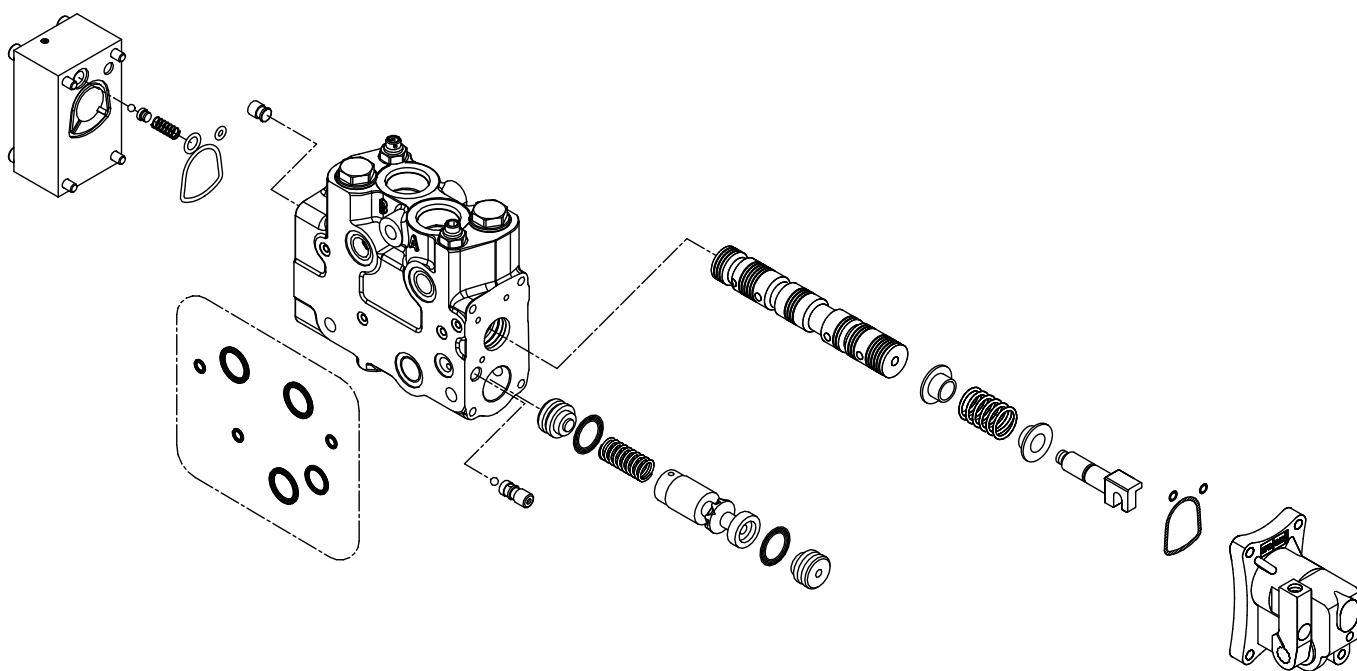
MANUAL CONTROL GAS
PR VALVES
PRVSL S VALVES

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180700	8 l/min.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/G	G1/2
S24180710	16 l/min.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/G	G1/2
S24180720	25 l/min.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/G	G1/2
S24180730	45 l/min.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/G	G1/2
S24180740	63 l/min.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/G	G1/2
S24180750	95 l/min.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/G	G1/2

E0.241.0613.05.00IM01

WORKING SECTION

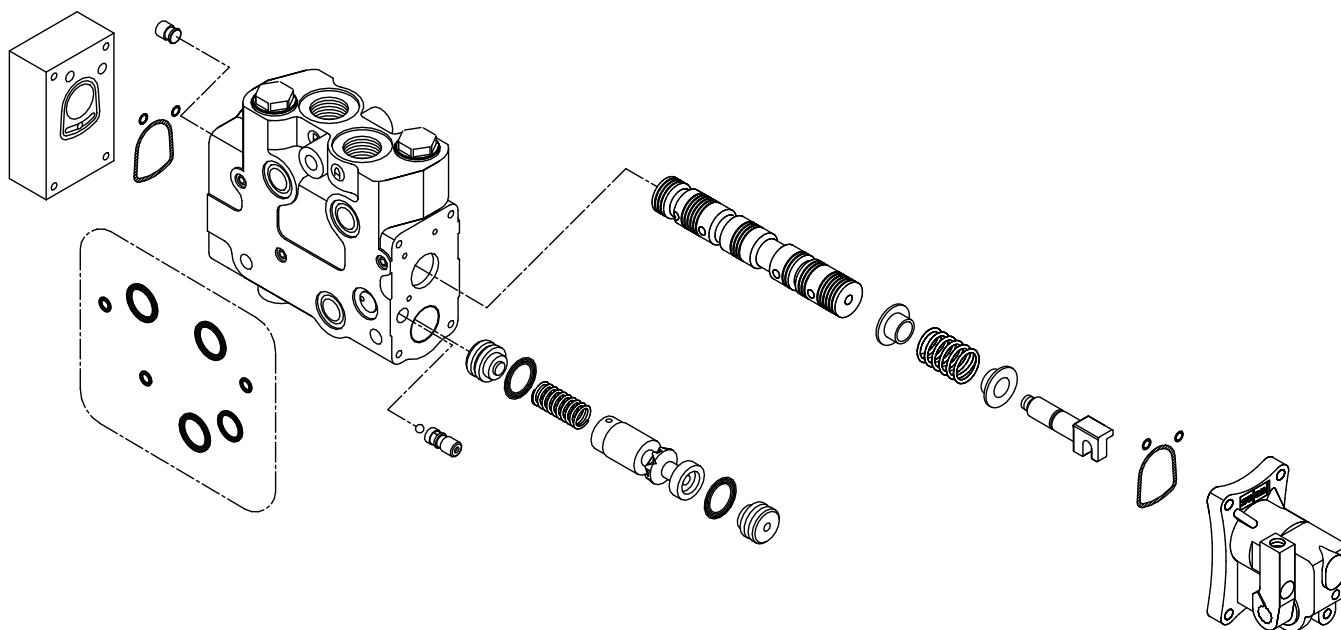
**MANUAL CONTROL SAE
PR VALVES
PRVSL S VALVES**



E0.241.0613.05.001M01

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180760	2,1 gpm.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/S	SAE10
S24180770	4,2 gpm.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/S	SAE10
S24180780	6,6 gpm.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/S	SAE10
S24180790	11,8 gpm.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/S	SAE10
S24180800	16,6 gpm.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/S	SAE10
S24180561	25 gpm.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-C2/S	SAE10

WORKING SECTION

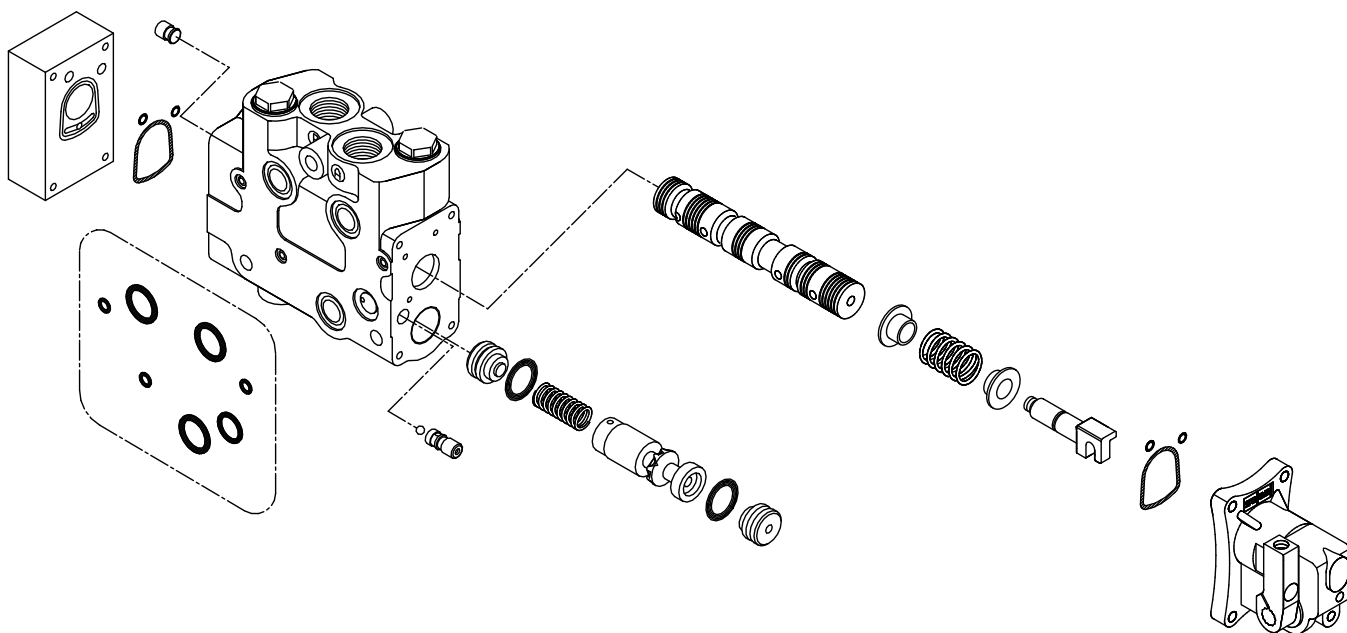
HYDRAULIC PROPORTIONAL CONTROL GAS
PR VALVES

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180077	8 l/min.	1011-PRA.PRB-NLA-IP/G	G1/2
S24180087	16 l/min.	1012-PRA.PRB-NLA-IP/G	G1/2
S24180097	25 l/min.	1013-PRA.PRB-NLA-IP/G	G1/2
S24180107	45 l/min.	1014-PRA.PRB-NLA-IP/G	G1/2
S24180117	63 l/min.	1015-PRA.PRB-NLA-IP/G	G1/2
S24180127	95 l/min.	1016-PRA.PRB-NLA-IP/G	G1/2

E0.241.0613.05.00IM01

WORKING SECTION

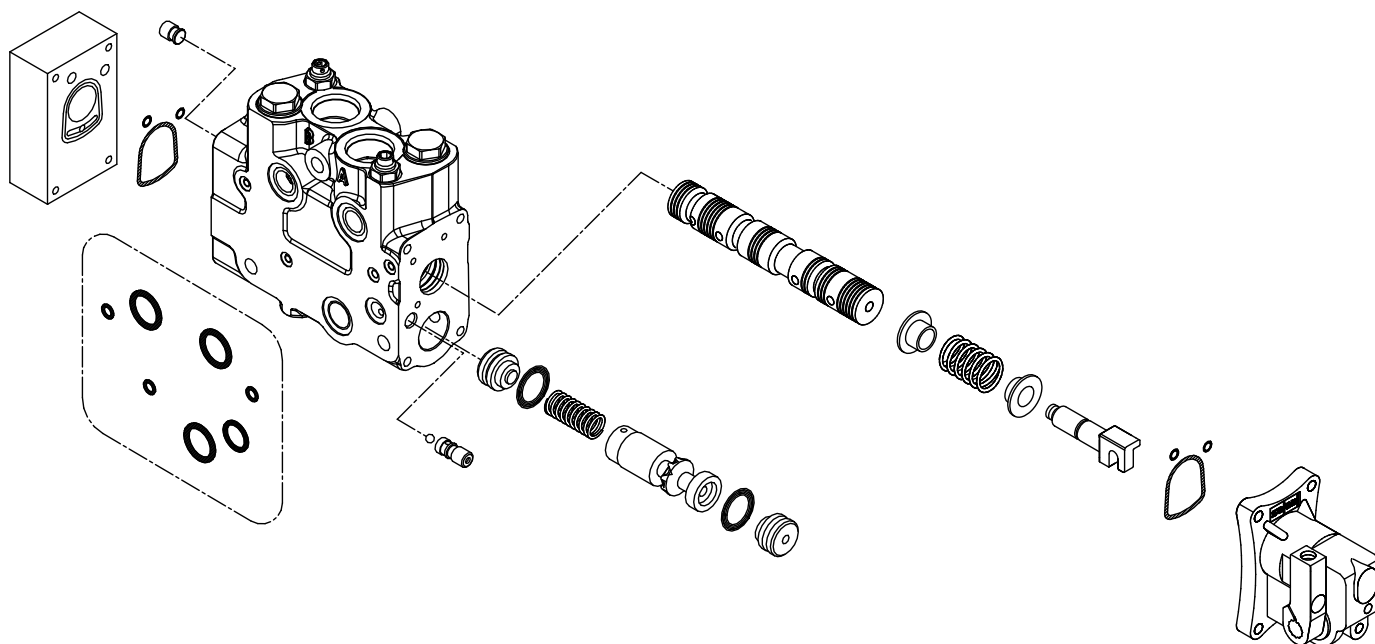
**HYDRAULIC PROPORTIONAL CONTROL SAE
PR VALVES**



PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180073	2,1 gpm	1011-PRA.PRB-NLA-IP/S	SAE10
S24180083	4,2 gpm.	1012-PRA.PRB-NLA-IP/S	SAE10
S24180093	6,6 gpm.	1013-PRA.PRB-NLA-IP/S	SAE10
S24180103	11,8 gpm.	1014-PRA.PRB-NLA-IP/S	SAE10
S24180113	16,6 gpm.	1015-PRA.PRB-NLA-IP/S	SAE10
S24180123	25 gpm.	1016-PRA.PRB-NLA-IP/S	SAE10

E0.241.0613.05.001M01

WORKING SECTION

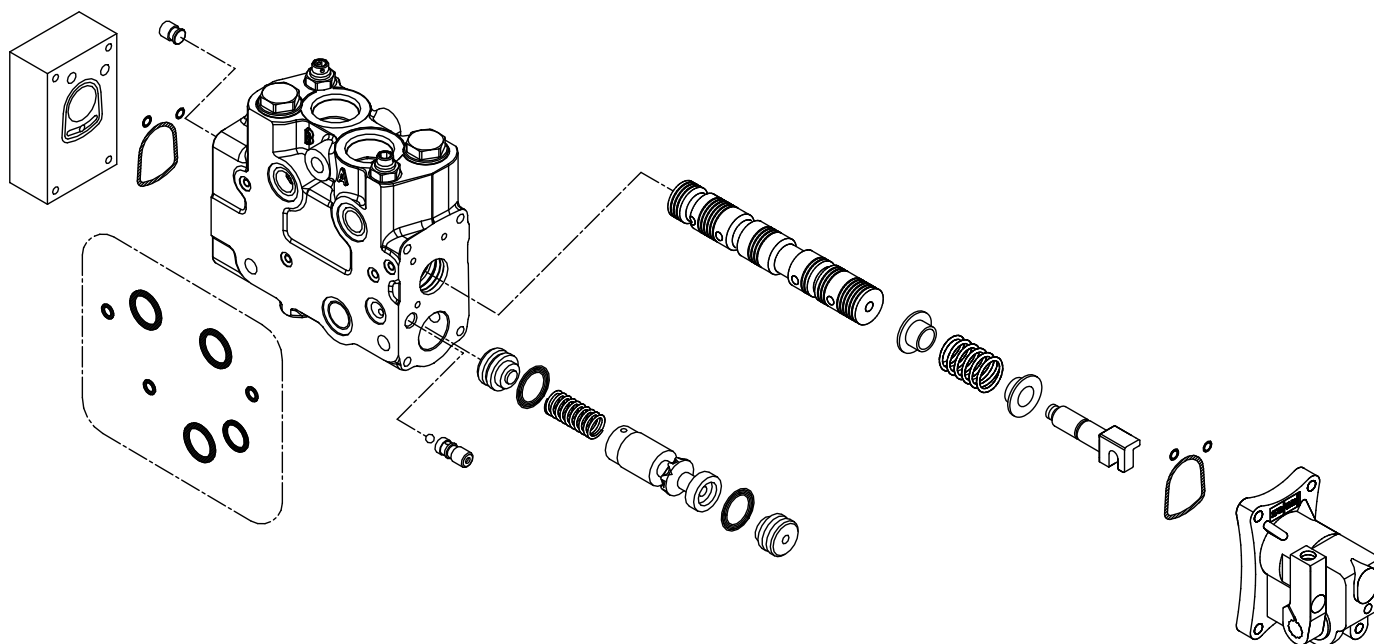
HYDRAULIC PROPORTIONAL CONTROL GAS
PR VALVES
PRVSL5 VALVE

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180810	8 l/min.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/G	G1/2
S24180820	16 l/min.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/G	G1/2
S24180830	25 l/min.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/G	G1/2
S24180840	45 l/min.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/G	G1/2
S24180850	63 l/min.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/G	G1/2
S24180860	95 l/min.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/G	G1/2

E0.241.0613.05.00IM01

WORKING SECTION

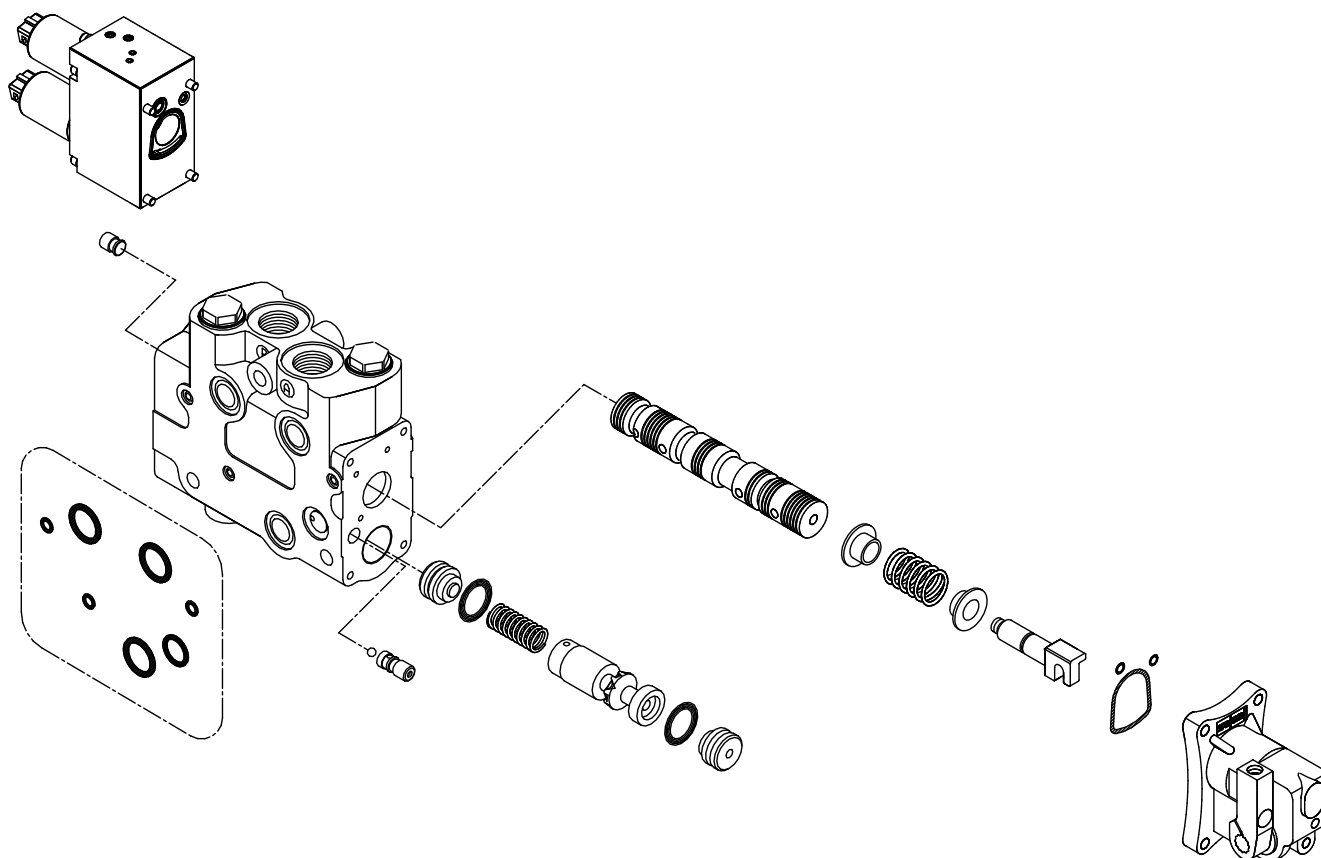
**HYDRAULIC PROPORTIONAL CONTROL SAE
PR VALVES
PRVSL S VALVE**



E0.241.0613.05.001M01

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180870	2,1 gpm.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/S	SAE10
S24180880	4,2 gpm.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/S	SAE10
S24180890	6,6 gpm.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/S	SAE10
S24180900	11,8 gpm.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/S	SAE10
S24180910	16,6 gpm.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/S	SAE10
S24180920	25 gpm.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-IP/S	SAE10

WORKING SECTION

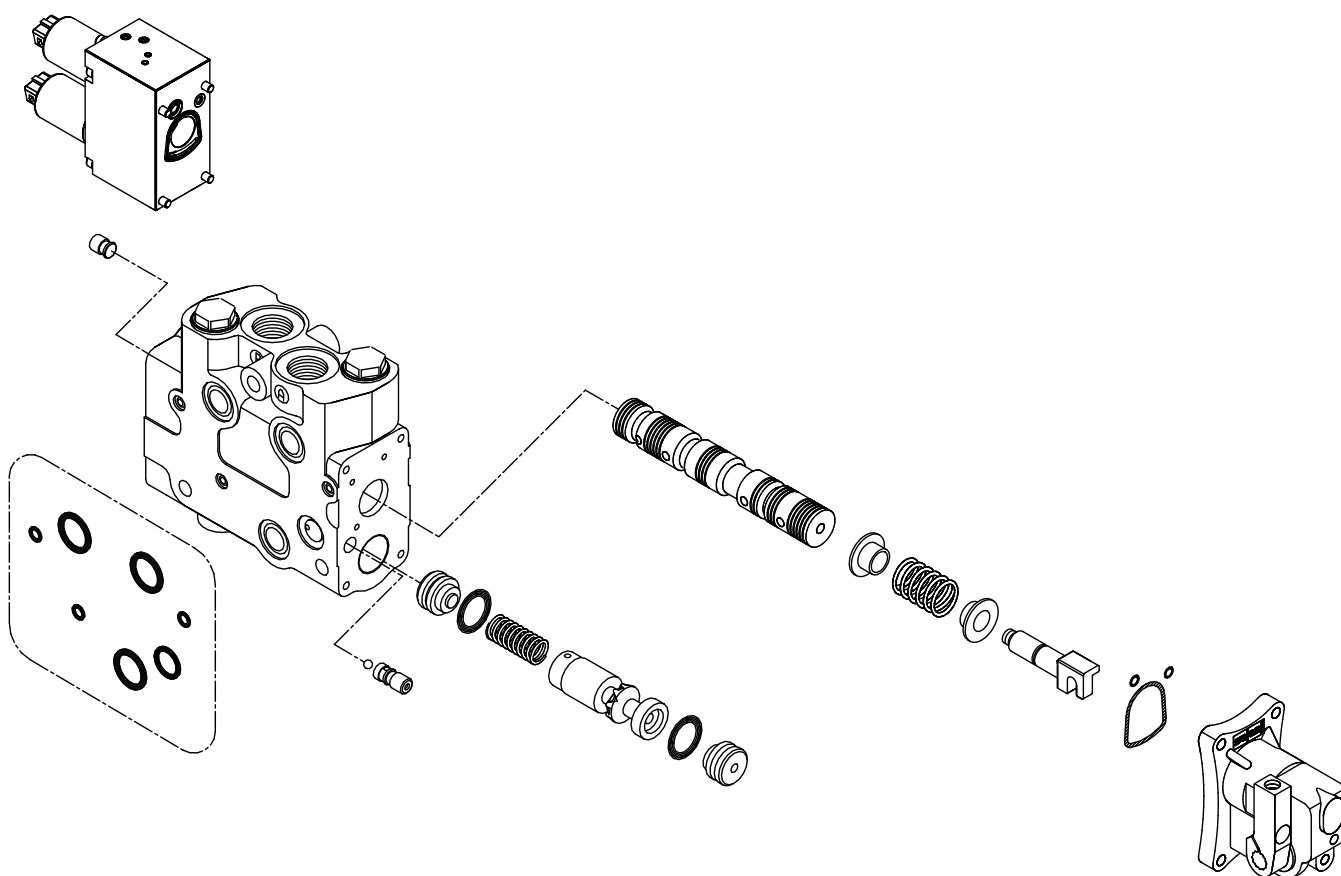
PROPORTIONAL ELECTRONIC CONTROL 12Vdc GAS
PR VALVES

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180653	8 l/min.	1011-PRA.PR-B-NLA-KE1/G	G1/2
S24180654	16 l/min.	1012-PRA.PR-B-NLA-KE1/G	G1/2
S24180652	25 l/min.	1013-PRA.PR-B-NLA-KE1/G	G1/2
S24180655	45 l/min.	1014-PRA.PR-B-NLA-KE1/G	G1/2
S24180656	63 l/min.	1015-PRA.PR-B-NLA-KE1/G	G1/2
S24180657	95 l/min.	1016-PRA.PR-B-NLA-KE1/G	G1/2

EC.241.0613.05.001M01

WORKING SECTION

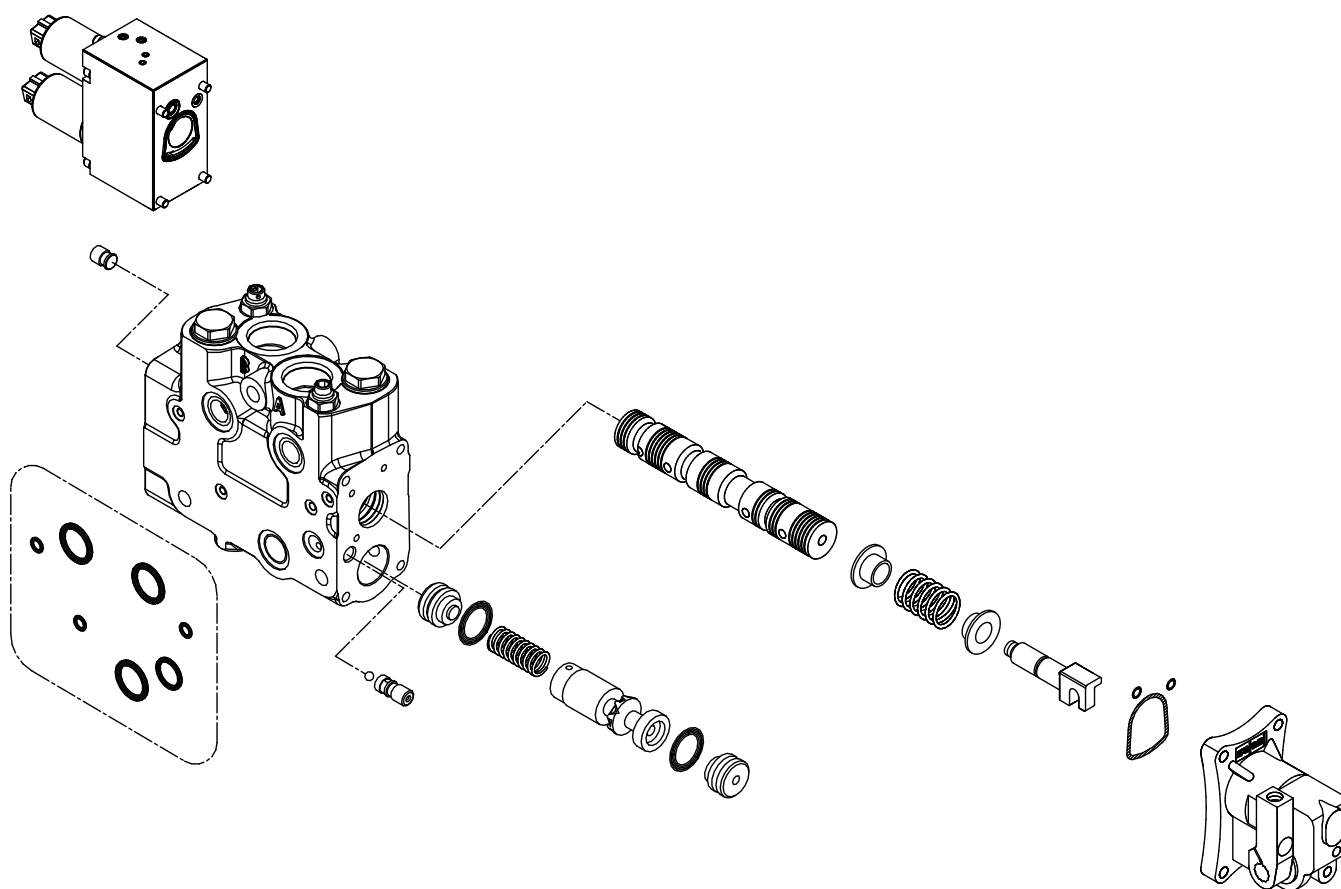
**PROPORTIONAL ELECTRONIC CONTROL 12Vdc SAE
PR VALVES**



E0.241.0613.05.001M01

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180641	2,1 gpm.	1011-PRA.PRB-NLA-KE1/S	SAE10
S24180642	4,2 gpm.	1012-PRA.PRB-NLA-KE1/S	SAE10
S24180640	6,6 gpm.	1013-PRA.PRB-NLA-KE1/S	SAE10
S24180643	11,8 gpm.	1014-PRA.PRB-NLA-KE1/S	SAE10
S24180644	16,6 gpm.	1015-PRA.PRB-NLA-KE1/S	SAE10
S24180645	25 gpm.	1016-PRA.PRB-NLA-KE1/S	SAE10

WORKING SECTION

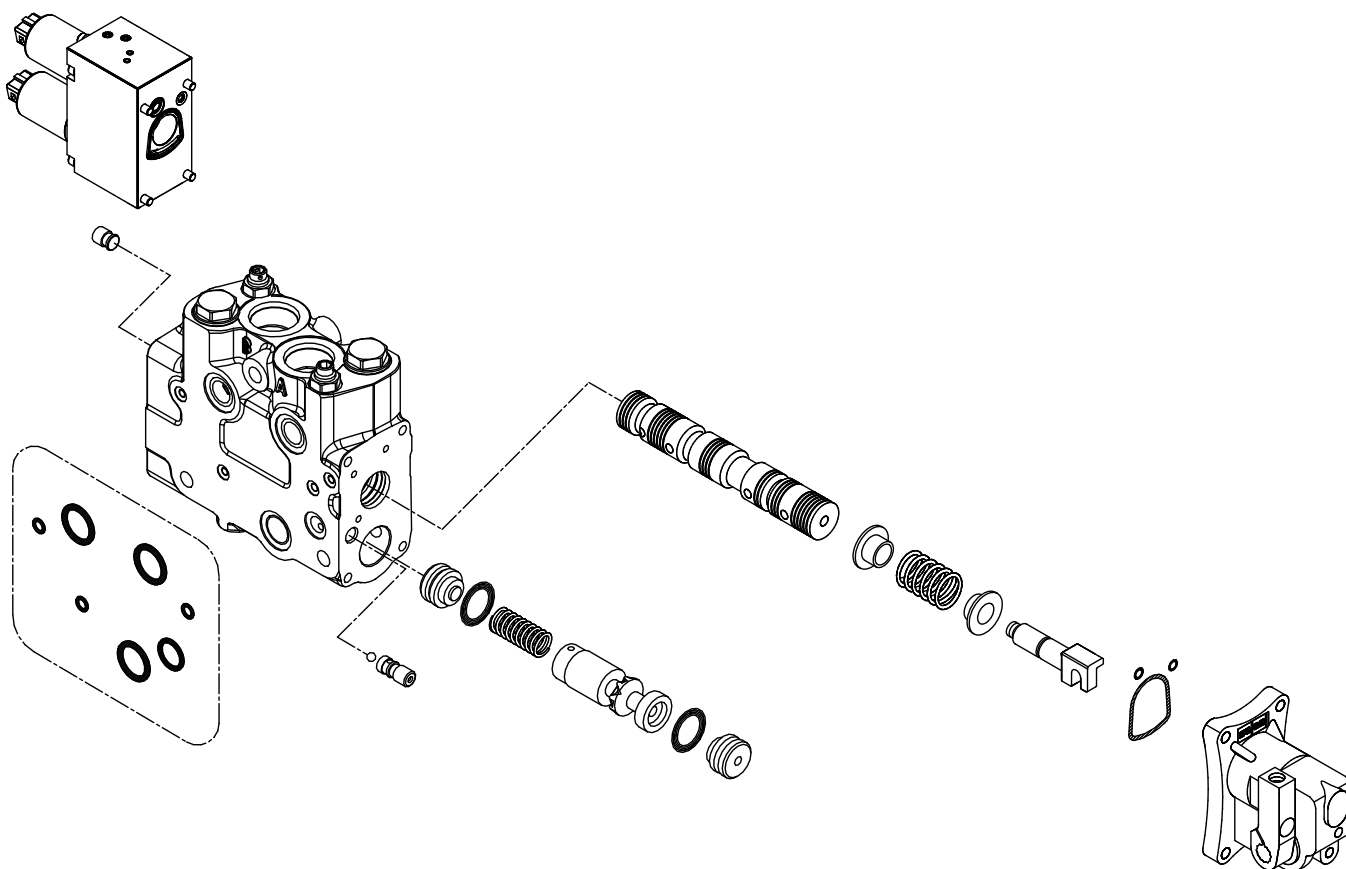
PROPORTIONAL ELECTRONIC CONTROL 12Vdc GAS
PR VALVES
PRVSLS VALVE

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180930	8 l/min.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/G	G1/2
S24180940	16 l/min.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/G	G1/2
S24180950	25 l/min.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/G	G1/2
S24180960	45 l/min.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/G	G1/2
S24180970	63 l/min.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/G	G1/2
S24180980	95 l/min.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/G	G1/2

E0.241.0613.05.00IM01

WORKING SECTION

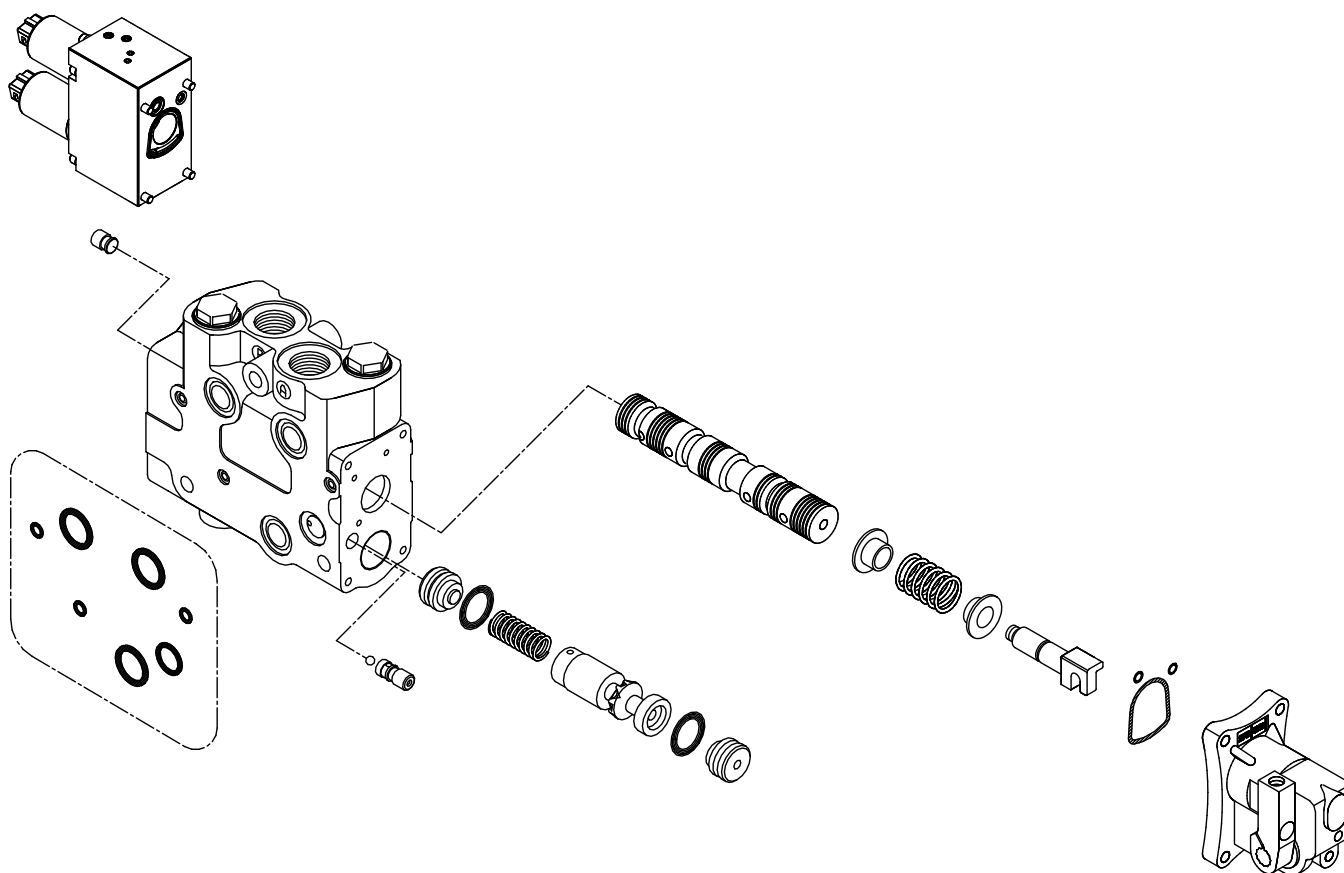
**PROPORTIONAL ELECTRONIC CONTROL 12Vdc SAE
PR VALVES
PRVSLS VALVE**



E0.241.0613.05.001M01

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180990	2,1 gpm.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/S	SAE10
S24181000	4,2 gpm.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/S	SAE10
S24181010	6,6 gpm.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/S	SAE10
S24181020	11,8 gpm.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/S	SAE10
S24181030	16,6 gpm.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/S	SAE10
S24181040	25 gpm.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-KE1/S	SAE10

WORKING SECTION

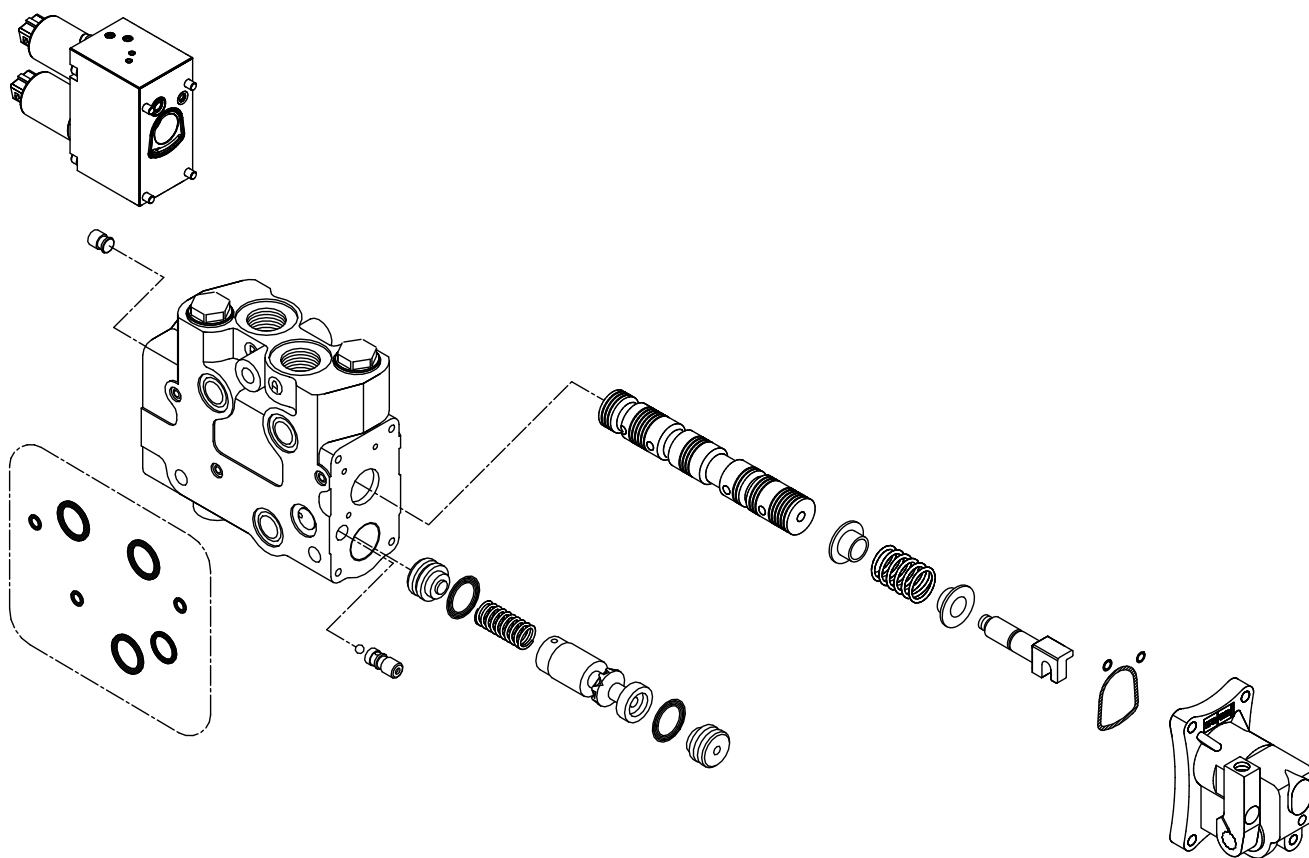
PROPORTIONAL ELECTRONIC CONTROL 24Vdc GAS
PR VALVES

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180658	8 l/min.	1011-PRA.PRB-NLA-KE2/G	G1/2
S24180659	16 l/min.	1012-PRA.PRB-NLA-KE2/G	G1/2
S24180660	25 l/min.	1013-PRA.PRB-NLA-KE2/G	G1/2
S24180661	45 l/min.	1014-PRA.PRB-NLA-KE2/G	G1/2
S24180662	63 l/min.	1015-PRA.PRB-NLA-KE2/G	G1/2
S24180663	95 l/min.	1016-PRA.PRB-NLA-KE2/G	G1/2

E0.241.0613.05.00IM01

WORKING SECTION

**PROPORTIONAL ELECTRONIC CONTROL 24Vdc SAE
PR VALVES**

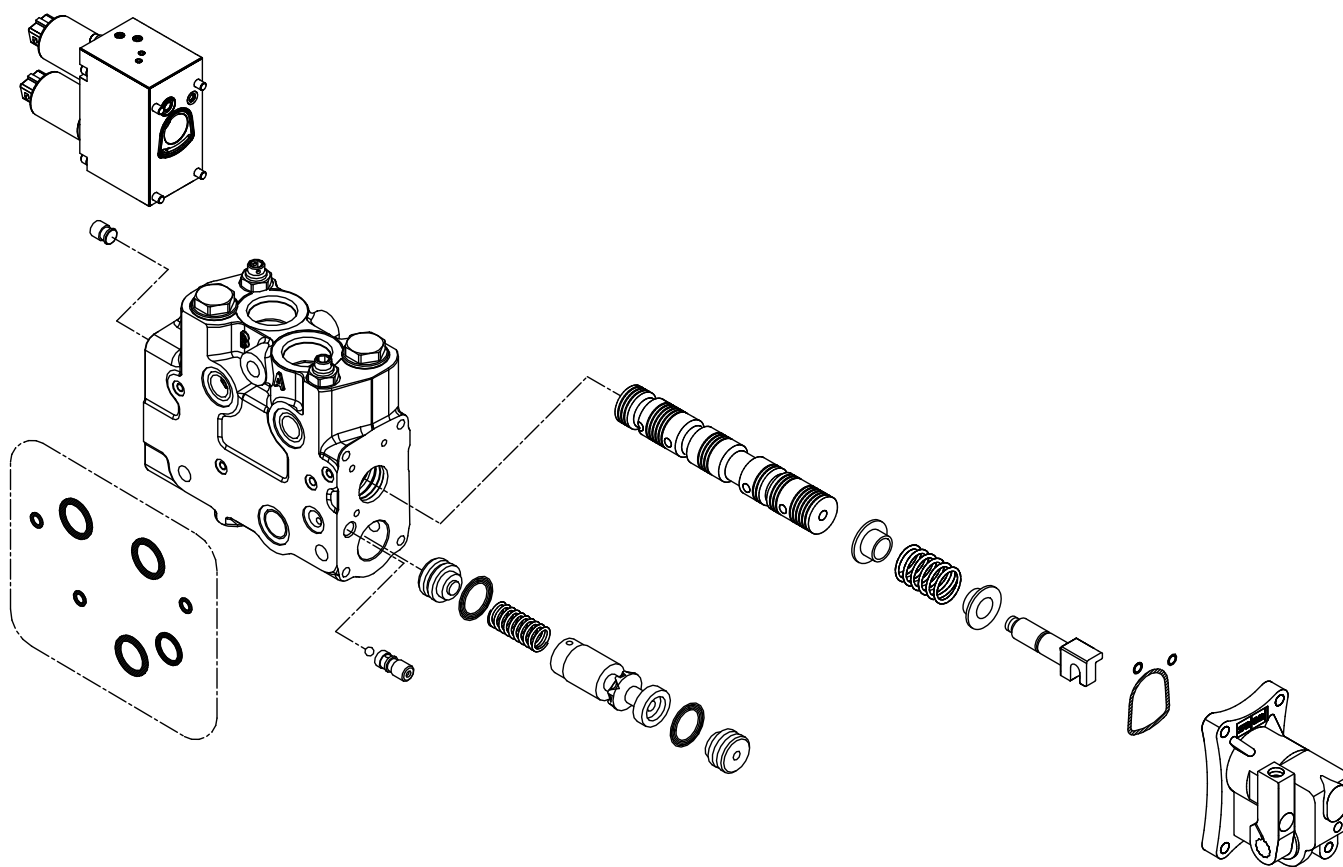


PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180646	2,1 gpm.	1011-PRA.PR-B-NLA-KE2/S	SAE10
S24180647	4,2 gpm.	1012-PRA.PR-B-NLA-KE2/S	SAE10
S24180648	6,6 gpm.	1013-PRA.PR-B-NLA-KE2/S	SAE10
S24180649	11,8 gpm.	1014-PRA.PR-B-NLA-KE2/S	SAE10
S24180650	16,6 gpm.	1015-PRA.PR-B-NLA-KE2/S	SAE10
S24180651	25 gpm.	1016-PRA.PR-B-NLA-KE2/S	SAE10

E0.241.0613.05.001M01



WORKING SECTION

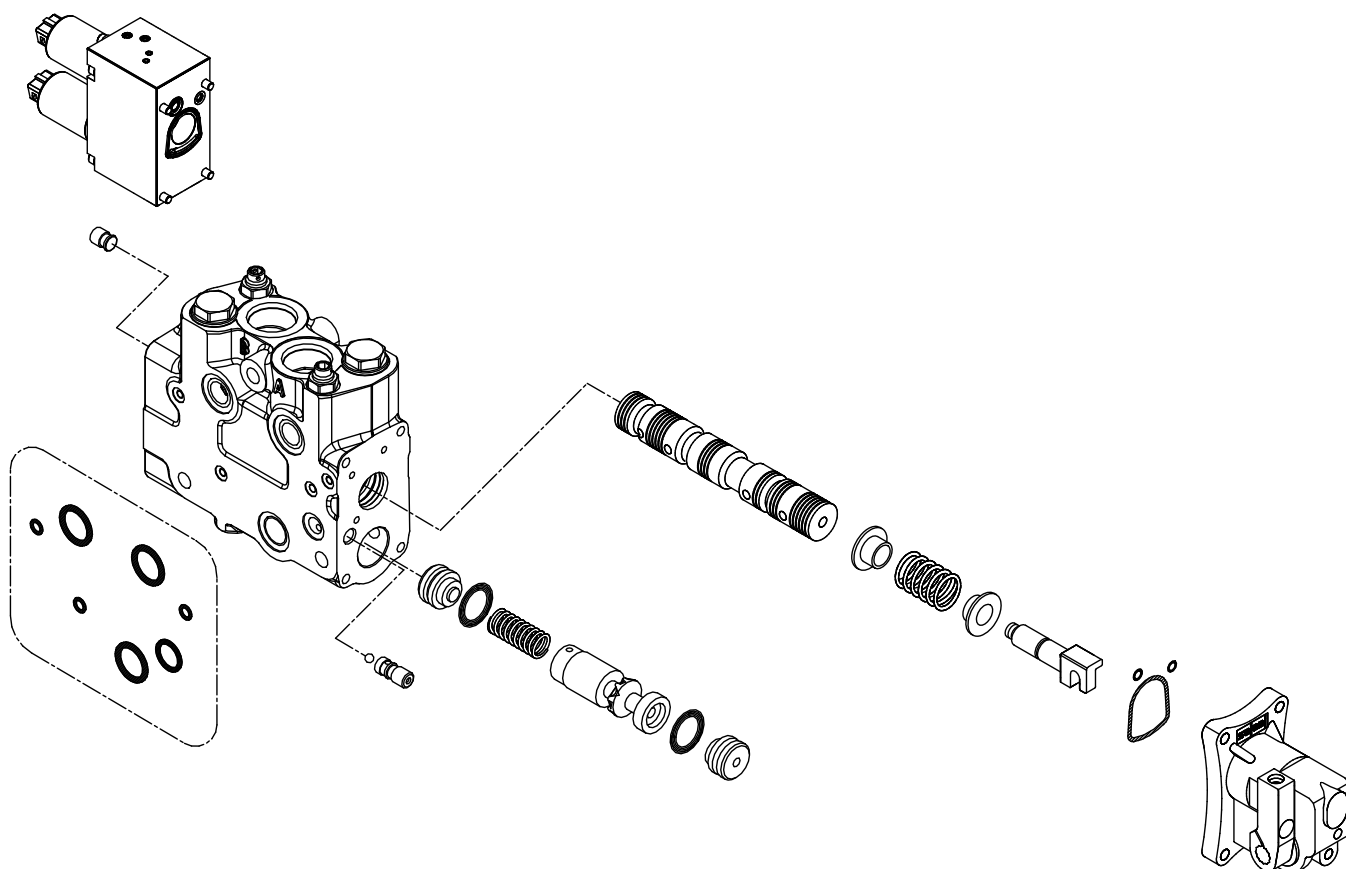
PROPORTIONAL ELECTRONIC CONTROL 24Vdc GAS
PR VALVES
PRVSLS VALVE

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24181050	8 l/min.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/G	G1/2
S24181060	16 l/min.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/G	G1/2
S24181070	25 l/min.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/G	G1/2
S24181080	45 l/min.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/G	G1/2
S24181090	63 l/min.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/G	G1/2
S24181100	95 l/min.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/G	G1/2

E0.241.0613.05.001M01

WORKING SECTION

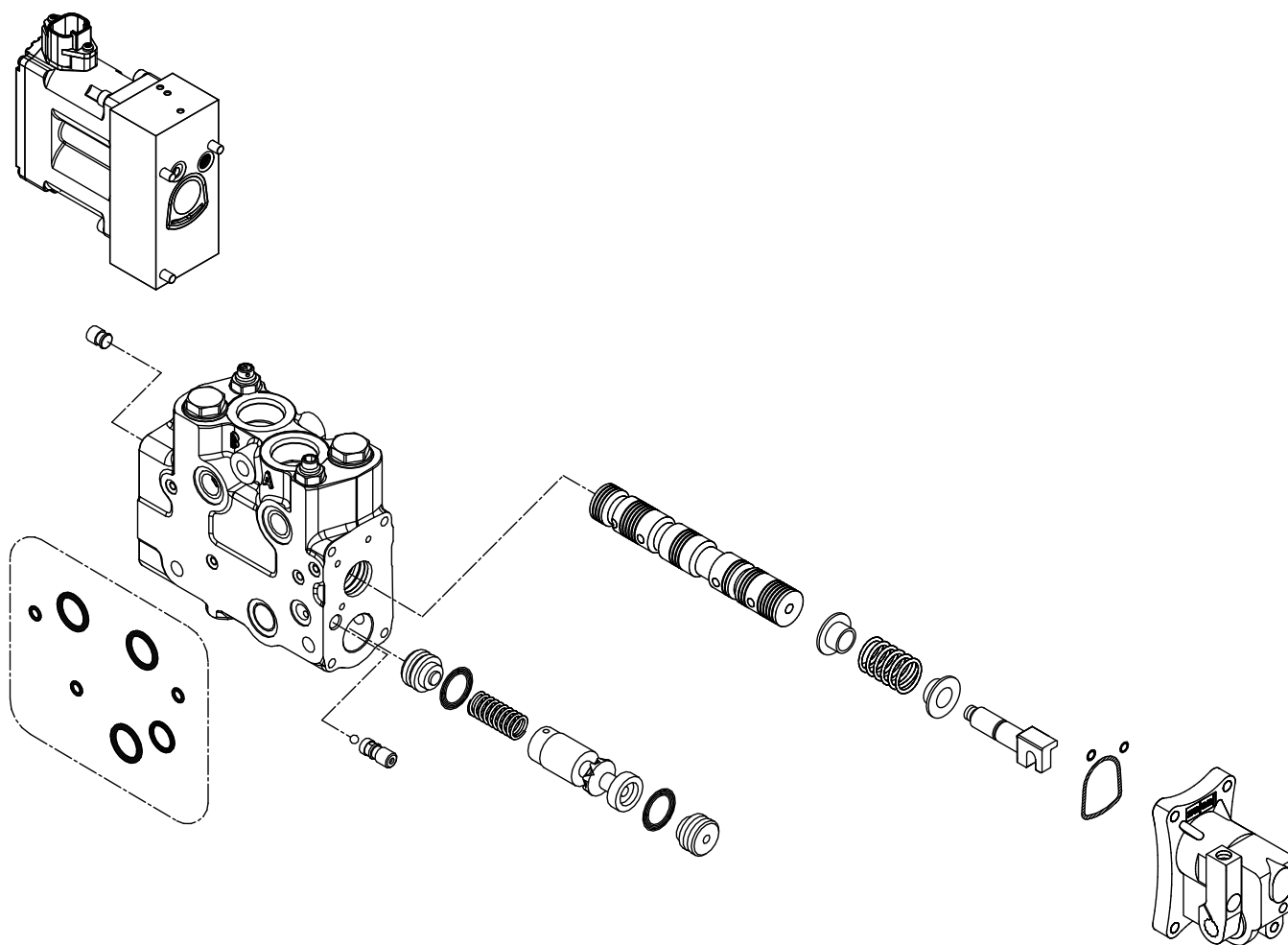
**PROPORTIONAL ELECTRONIC CONTROL 24Vdc SAE
PR VALVES
PRVSLS VALVE**



E0.241.0613.05.001M01

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24181110	2,1 gpm.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/S	SAE10
S24181120	4,2 gpm.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/S	SAE10
S24181130	6,6 gpm.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/S	SAE10
S24181140	11,8 gpm.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/S	SAE10
S24181150	16,6 gpm.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/S	SAE10
S24181160	25 gpm.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-KE2/S	SAE10

WORKING SECTION

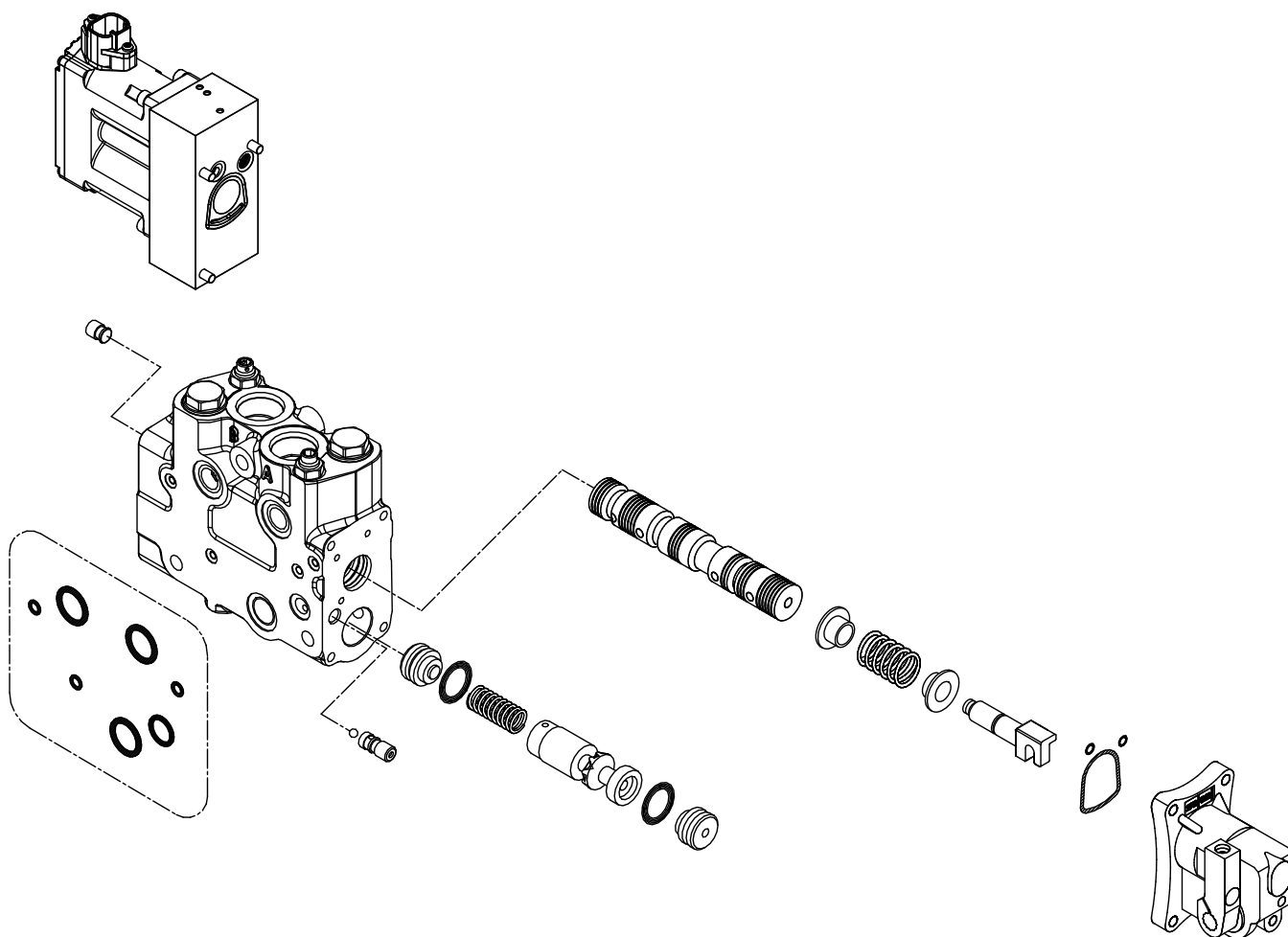
CLOSED LOOP PROPORTIONAL ELECTRONIC CONTROL "GAS"
PRVSLS VALVE

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24181170	8 l/min.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/G	G1/2
S24181180	16 l/min.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/G	G1/2
S24181190	25 l/min.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/G	G1/2
S24181200	45 l/min.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/G	G1/2
S24181210	63 l/min.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/G	G1/2
S24181220	95 l/min.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/G	G1/2

E0.241.0613.05.001M01

WORKING SECTION

**CLOSED LOOP PROPORTIONAL ELECTRONIC CONTROL "SAE"
PRVSLS VALVE**

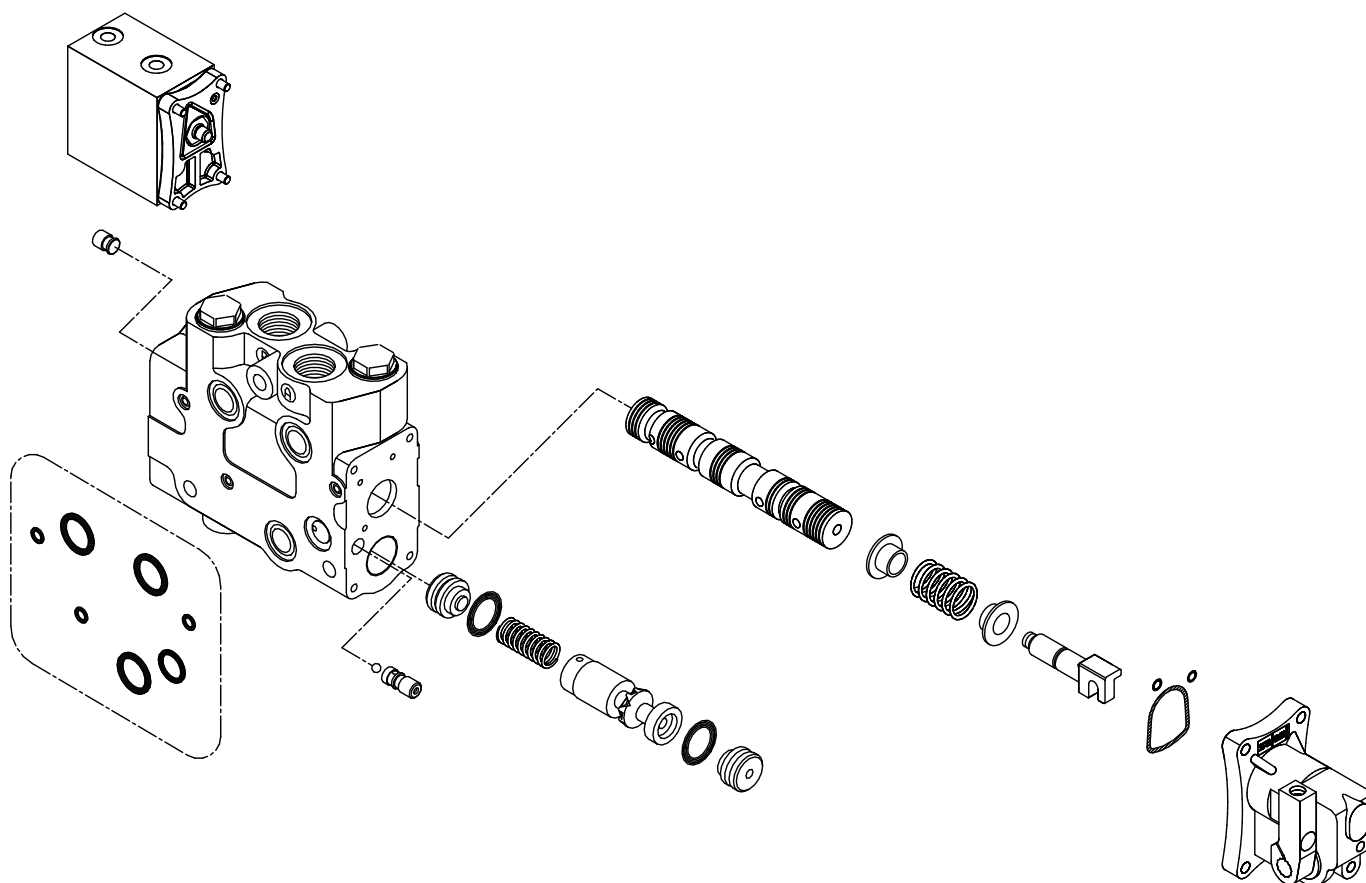


PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24181230	2,1 gpm.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/S	SAE10
S24181240	4,2 gpm.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/S	SAE10
S24181250	6,6 gpm.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/S	SAE10
S24181260	11,8 gpm.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/S	SAE10
S24181270	16,6 gpm.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/S	SAE10
S24181280	25 gpm.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-KM/S	SAE10

E0.241.0613.05.001M01



WORKING SECTION

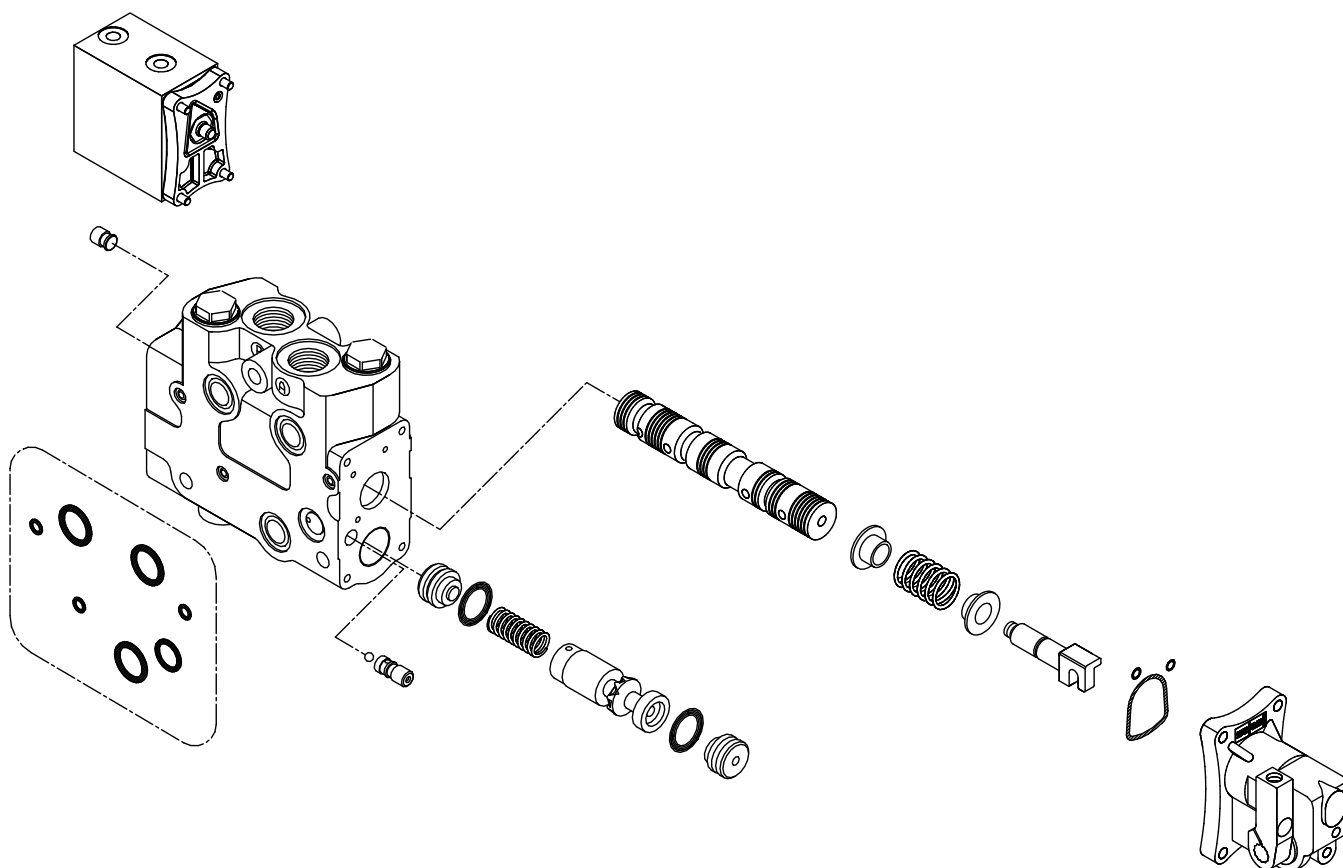
PNEUMATIC PROPORTIONAL CONTROL GAS
PR VALVES

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180670	8 l/min.	1011-PRA.PRB-NLA-PP/G	G1/2
S24180671	16 l/min.	1012-PRA.PRB-NLA-PP/G	G1/2
S24180672	25 l/min.	1013-PRA.PRB-NLA-PP/G	G1/2
S24180673	45 l/min.	1014-PRA.PRB-NLA-PP/G	G1/2
S24180674	63 l/min.	1015-PRA.PRB-NLA-PP/G	G1/2
S24180675	95 l/min.	1016-PRA.PRB-NLA-PP/G	G1/2

E0.241.0613.05.001M01

WORKING SECTION

**PNEUMATIC PROPORTIONAL CONTROL SAE
PR VALVES**

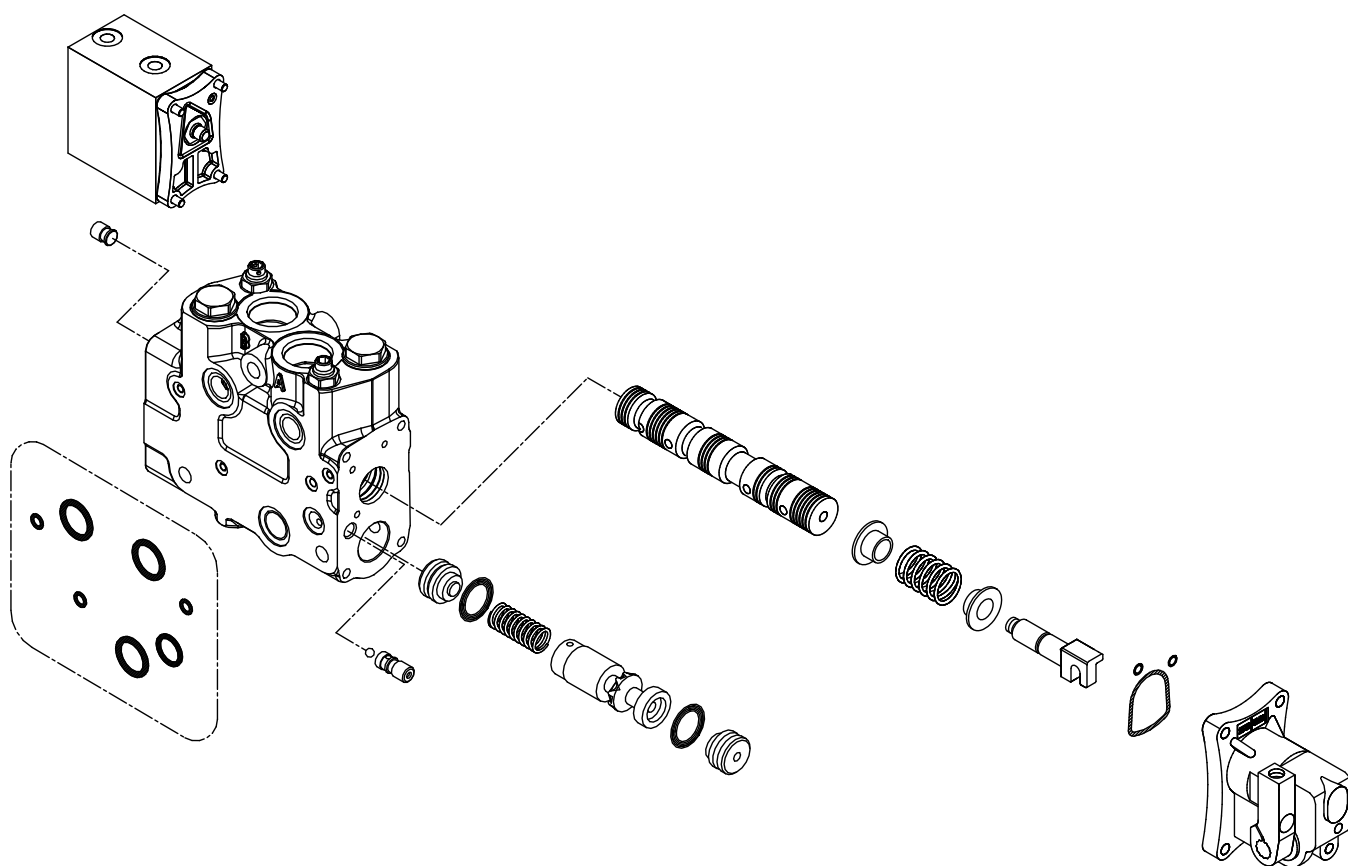


PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24180676	2,1 gpm.	1011-PRA.PRB-NLA-PP/S	SAE10
S24180677	4,2 gpm.	1012-PRA.PRB-NLA-PP/S	SAE10
S24180678	6,6 gpm.	1013-PRA.PRB-NLA-PP/S	SAE10
S24180679	11,8 gpm.	1014-PRA.PRB-NLA-PP/S	SAE10
S24180680	16,6 gpm.	1015-PRA.PRB-NLA-PP/S	SAE10
S24180681	25 gpm.	1016-PRA.PRB-NLA-PP/S	SAE10

E0.241.0613.05.001M01



WORKING SECTION

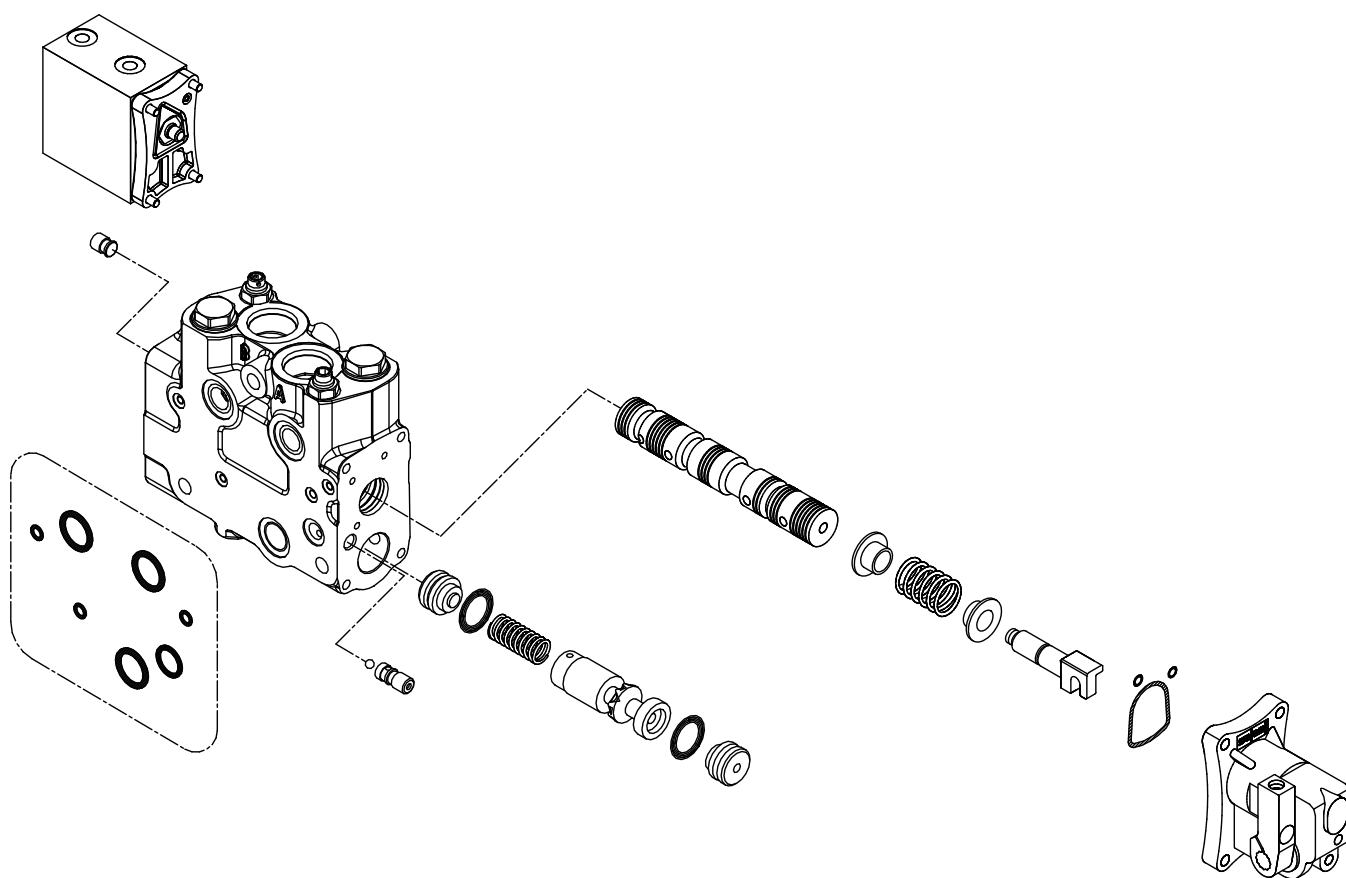
PNEUMATIC PROPORTIONAL CONTROL GAS
PR VALVES
PRVSLS VALVE

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24181290	8 l/min.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/G	G1/2
S24181300	16 l/min.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/G	G1/2
S24181310	25 l/min.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/G	G1/2
S24181320	45 l/min.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/G	G1/2
S24181330	63 l/min.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/G	G1/2
S24181340	95 l/min.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/G	G1/2

E0.241.0613.05.00IM01

WORKING SECTION

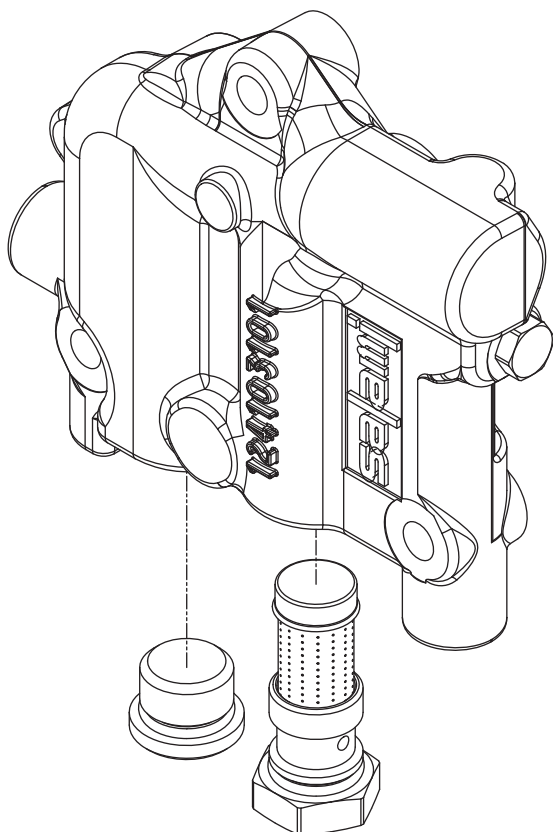
**PNEUMATIC PROPORTIONAL CONTROL SAE
PR VALVES
PRVSLS VALVE**



E0.241.0613.05.001M01

PART NUMBER	FLOW PORTS A/B	ORDERING CODE	A/B PORTS
S24181350	2,1 gpm.	1011-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/S	SAE10
S24181360	4,2 gpm.	1012-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/S	SAE10
S24181370	6,6 gpm.	1013-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/S	SAE10
S24181380	11,8 gpm.	1014-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/S	SAE10
S24181390	16,6 gpm.	1015-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/S	SAE10
S24181400	25 gpm.	1016-PRA.B-PRVSLSA.PRVSLSB-NLA-PP/S	SAE10



END PLATE

**Without pressure
reducing valve**

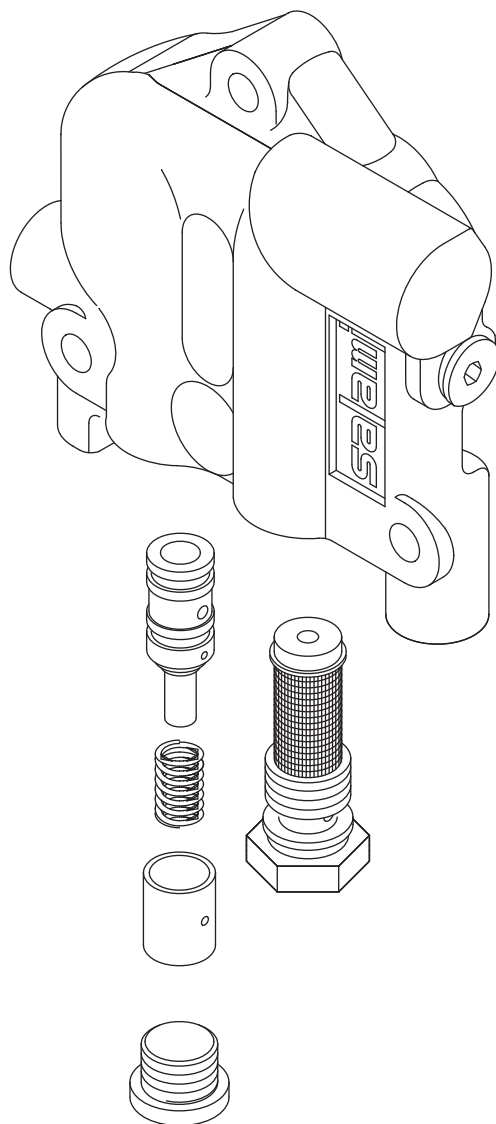
Part number R241 9001 0

Commercial Part number Code U0

EO.241.0613.05.00IM01

END PLATE

**With pressure
reducing valve
for KE and KM**

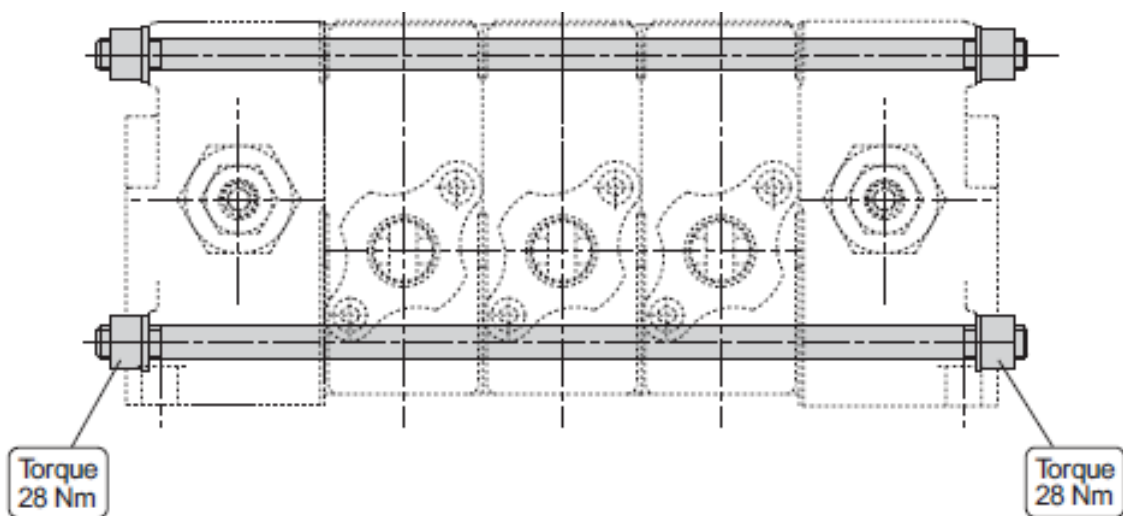


Part number R241 9002 0

Commercial Part number Code U1

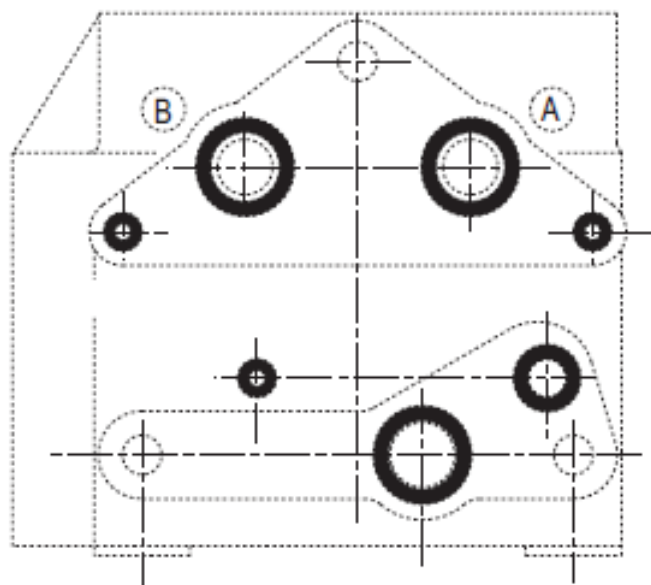
E0.241.0613.05.001M01

ASSEMBLY KIT SECTION



PART NUMBER	N.SPOOLS
R24185010	1
R24185020	2
R24185030	3
R24185040	4
R24185050	5
R24185060	6
R24185070	7
R24185080	8

SECTION SIDE SEAL KIT



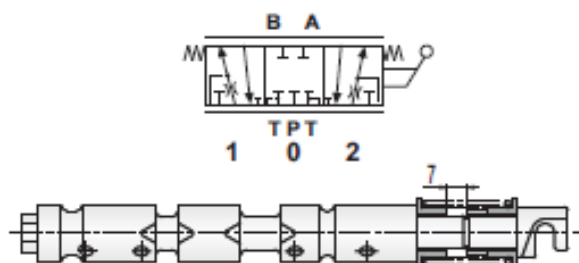
Part number - R24172580

EO.241.0613.05.00IM01

STANDARD MAIN SPOOLS FOR “NL” CONTROLS

code 01

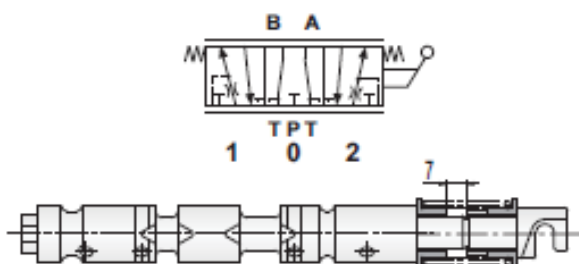
Double acting spool
(5 ways, 3 positions, A/B closed in neutral position)



Part number	Description	Flow control up to
R24175211	011	8 l/min. - 2,1 gpm.
R24175221	012	16 l/min. - 4,2 gpm.
R24175231	013	25 l/min. - 6,6 gpm.
R24175241	014	45 l/min. - 11,8 gpm.
R24175251	015	63 l/min. - 16,6 gpm.
R24175261	016	95 l/min. - 25 gpm.

code 02

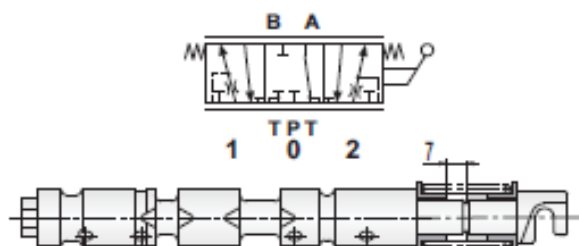
Motor spool
(5 ways, 3 positions, A/B → T in neutral position)



Part number	Description	Flow control up to
R24175212	021	8 l/min. - 2,1 gpm.
R24175222	022	16 l/min. - 4,2 gpm.
R24175232	023	25 l/min. - 6,6 gpm.
R24175242	024	45 l/min. - 11,8 gpm.
R24175252	025	63 l/min. - 16,6 gpm.
R24175262	026	95 l/min. - 25 gpm.

code 03

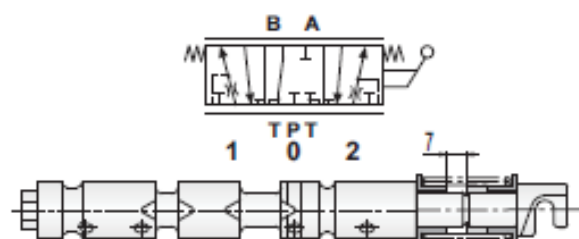
Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position)



Part number	Description	Flow control up to
R24175371	031	8 l/min. - 2,1 gpm.
R24175381	032	16 l/min. - 4,2 gpm.
R24175391	033	25 l/min. - 6,6 gpm.
R24175401	034	45 l/min. - 11,8 gpm.
R24175412	035	63 l/min. - 16,6 gpm.
R24175431	036	95 l/min. - 25 gpm.

code 04

Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position)



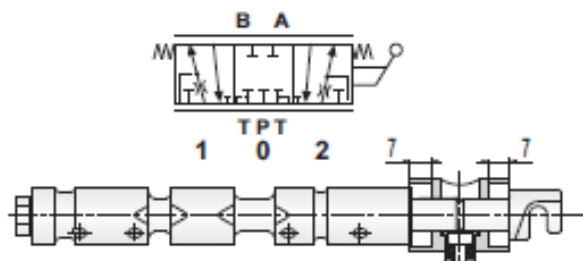
Part number	Description	Flow control up to
R24175372	041	8 l/min. - 2,1 gpm.
R24175382	042	16 l/min. - 4,2 gpm.
R24175392	043	25 l/min. - 6,6 gpm.
R24175402	044	45 l/min. - 11,8 gpm.
R24175413	045	63 l/min. - 16,6 gpm.
R24175432	046	95 l/min. - 25 gpm.

For spools code 05 and 06 (single acting A o B) you need the spool code 01 in a circuit described at pag.31

STANDARD MAIN SPOOLS FOR “FL” CONTROLS

code 01

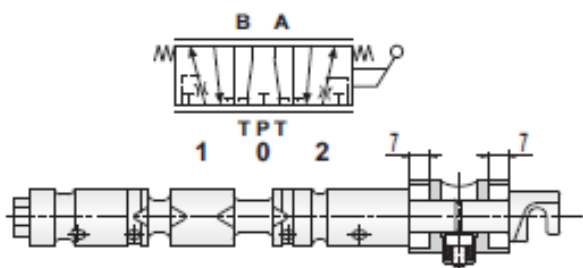
Double acting spool
(5 ways, 3 positions, A/B closed in neutral position)



Part number	Description	Flow control up to
R24175363	011	8 l/min. - 2,1 gpm.
R24175364	012	16 l/min. - 4,2 gpm.
R24175331	013	25 l/min. - 6,6 gpm.
R24175341	014	45 l/min. - 11,8 gpm.
R24175351	015	63 l/min. - 16,6 gpm.
R24175361	016	95 l/min. - 25 gpm.

code 02

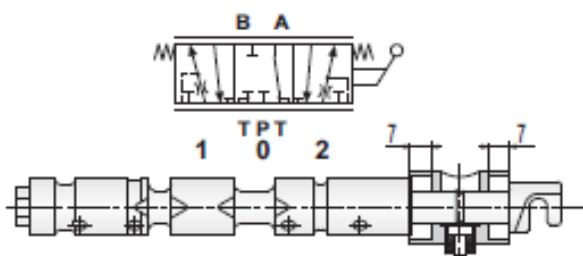
Motor spool
(5 ways, 3 positions, A/B → T in neutral position)



Part number	Description	Flow control up to
R24175365	021	8 l/min. - 2,1 gpm.
R24175366	022	16 l/min. - 4,2 gpm.
R24175332	023	25 l/min. - 6,6 gpm.
R24175342	024	45 l/min. - 11,8 gpm.
R24175352	025	63 l/min. - 16,6 gpm.
R24175362	026	95 l/min. - 25 gpm.

code 03

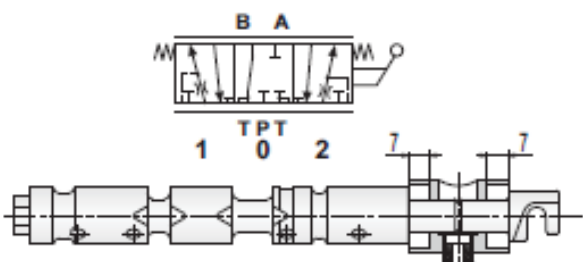
Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position)



Part number	Description	Flow control up to
R24175367	031	8 l/min. - 2,1 gpm.
R24175368	032	16 l/min. - 4,2 gpm.
R24175440	033	25 l/min. - 6,6 gpm.
R24175442	034	45 l/min. - 11,8 gpm.
R24175444	035	63 l/min. - 16,6 gpm.
R24175446	036	95 l/min. - 25 gpm.

code 04

Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position)



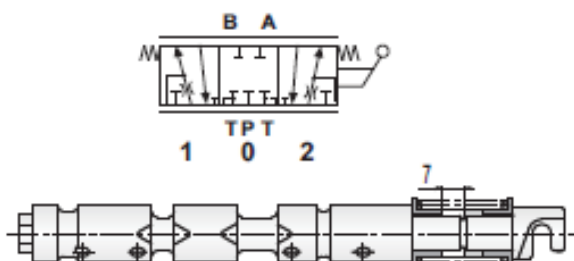
Part number	Description	Flow control up to
R24175448	041	8 l/min. - 2,1 gpm.
R24175449	042	16 l/min. - 4,2 gpm.
R24175441	043	25 l/min. - 6,6 gpm.
R24175443	044	45 l/min. - 11,8 gpm.
R24175445	045	63 l/min. - 16,6 gpm.
R24175447	046	95 l/min. - 25 gpm.

For spools code 05 and 06 (single acting A or B) you need the spool code 01 in a circuit described at pag.31

STANDARD MAIN SPOOLS FOR "IP" CONTROLS

Double acting spool
(5 ways, 3 positions, A/B closed in neutral position)

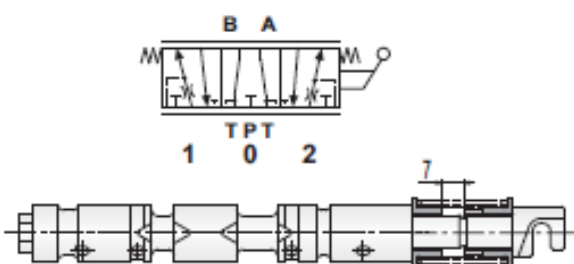
code 01



Part number	Description	Flow control up to
R24175213	011	8 l/min. - 2,1 gpm.
R24175223	012	16 l/min. - 4,2 gpm.
R24175233	013	25 l/min. - 6,6 gpm.
R24175243	014	45 l/min. - 11,8 gpm.
R24175253	015	63 l/min. - 16,6 gpm.
R24175263	016	95 l/min. - 25 gpm.

Motor spool
(5 ways, 3 positions, A/B → T in neutral position)

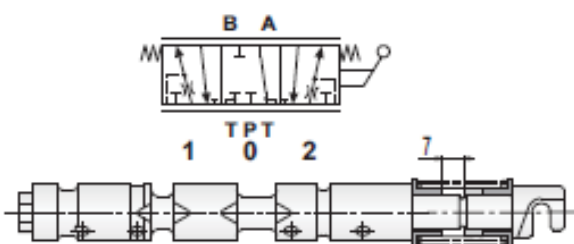
code 02



Part number	Description	Flow control up to
R24175214	021	8 l/min. - 2,1 gpm.
R24175224	022	16 l/min. - 4,2 gpm.
R24175234	023	25 l/min. - 6,6 gpm.
R24175244	024	45 l/min. - 11,8 gpm.
R24175254	025	63 l/min. - 16,6 gpm.
R24175264	026	95 l/min. - 25 gpm.

Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position)

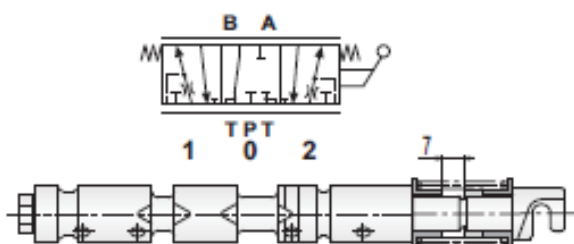
code 03



Part number	Description	Flow control up to
R24175373	031	8 l/min. - 2,1 gpm.
R24175383	032	16 l/min. - 4,2 gpm.
R24175393	033	25 l/min. - 6,6 gpm.
R24175403	034	45 l/min. - 11,8 gpm.
R24175414	035	63 l/min. - 16,6 gpm.
R24175433	036	95 l/min. - 25 gpm.

Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position)

code 04



Part number	Description	Flow control up to
R24175374	041	8 l/min. - 2,1 gpm.
R24175384	042	16 l/min. - 4,2 gpm.
R24175394	043	25 l/min. - 6,6 gpm.
R24175404	044	45 l/min. - 11,8 gpm.
R24175415	045	63 l/min. - 16,6 gpm.
R24175434	046	95 l/min. - 25 gpm.

E0.241.0613.05.001M01

For spools code 05 and 06 (single acting A o B) you need the spool code 01 in a circuit described at pag.31

STANDARD MAIN SPOOLS FOR “PP-KM-KE” CONTROLS

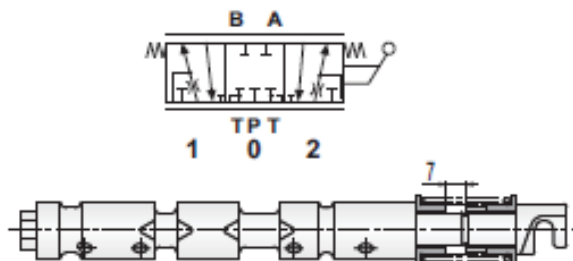
Part number	Description	Flow control up to
R24175215	011	8 l/min. - 2,1 gpm.
R24175226	012	16 l/min. - 4,2 gpm.
R24175230	013	25 l/min. - 6,6 gpm.
R24175245	014	45 l/min. - 11,8 gpm.
R24175250	015	63 l/min. - 16,6 gpm.
R24175260	016	95 l/min. - 25 gpm.

Part number	Description	Flow control up to
R24175216	021	8 l/min. - 2,1 gpm.
R24175225	022	16 l/min. - 4,2 gpm.
R24175235	023	25 l/min. - 6,6 gpm.
R24175246	024	45 l/min. - 11,8 gpm.
R24175255	025	63 l/min. - 16,6 gpm.
R24175265	026	95 l/min. - 25 gpm.

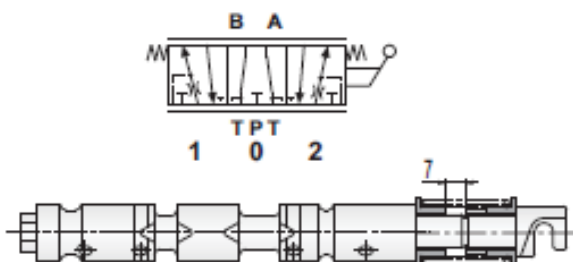
Part number	Description	Flow control up to
R24175370	031	8 l/min. - 2,1 gpm.
R24175380	032	16 l/min. - 4,2 gpm.
R24175390	033	25 l/min. - 6,6 gpm.
R24175400	034	45 l/min. - 11,8 gpm.
R24175410	035	63 l/min. - 16,6 gpm.
R24175430	036	95 l/min. - 25 gpm.

Part number	Description	Flow control up to
R24175375	041	8 l/min. - 2,1 gpm.
R24175385	042	16 l/min. - 4,2 gpm.
R24175395	043	25 l/min. - 6,6 gpm.
R24175405	044	45 l/min. - 11,8 gpm.
R24175416	045	63 l/min. - 16,6 gpm.
R24175435	046	95 l/min. - 25 gpm.

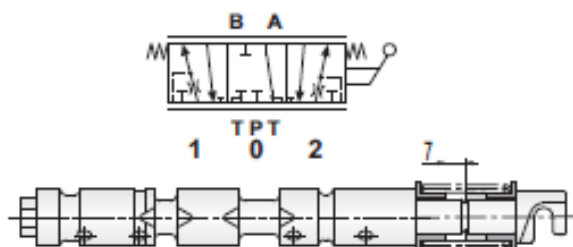
Double acting spool
(5 ways, 3 positions, A/B closed in neutral position) **code 01**



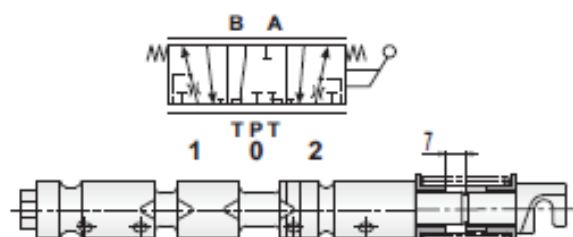
Motor spool
(5 ways, 3 positions, A/B → T in neutral position) **code 02**



Double acting motor spool port A (B port blocked)
(5 ways, 3 positions, B closed in neutral position) **code 03**



Double acting motor spool port B (A port blocked)
(5 ways, 3 positions, A closed in neutral position) **code 04**

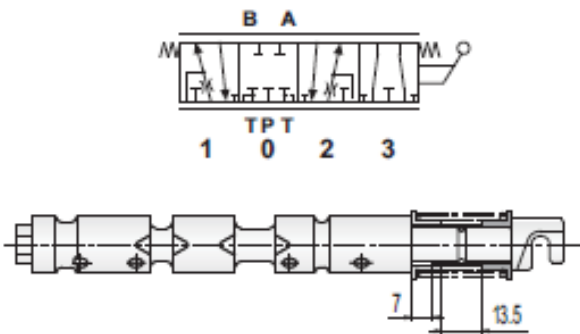


For spools code 05 and 06 (single acting A o B) you need the spool code 01 in a circuit described at pag.31

FLOAT SPOOL FOR “NL” CONTROLS

code 11

Double acting spool with float position
(5 ways, 4 positions, AB closed in neutral position)



Part number	Description	Flow control up to
R24175450	011	8 l/min. - 2,1 gpm.
R24175451	012	16 l/min. - 4,2 gpm.
R24175452	013	25 l/min. - 6,6 gpm.
R24175453	014	45 l/min. - 11,8 gpm.
R24175454	015	63 l/min. - 16,6 gpm.
R24175455	016	95 l/min. - 25 gpm.

Available only with manual control “ NL “
Float position can be achieved only pushing forward the lever
this spool can be mounted only with lever on “ A “ SIDE
BEFORE TO ORDER THIS CODE , PLEASE GET IN TOUCH WITH OUR SALES DEPT.

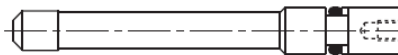
WORKING SECTIONS SPECIAL CIRCUITS



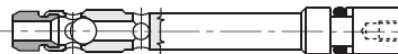
- 1 - Plug Part number R24172751



- 2 - Single acting port Part number R24172780



- 3 - Single acting port Part number R24172770



- 4 - Shuttle assy port Part number R24172760

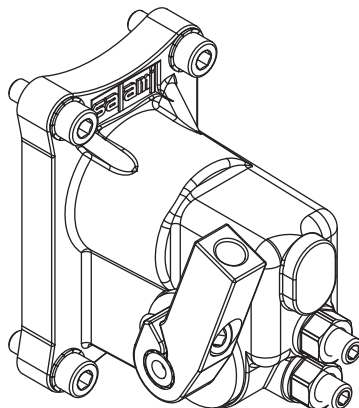


- 5 - Shuttle assy element Part number R24172730

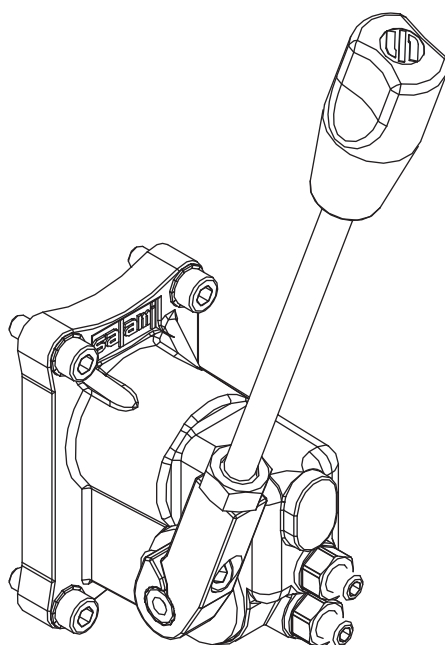
E0.241.0613.05.001M01



LEVER BOX "SL-NL-FL"

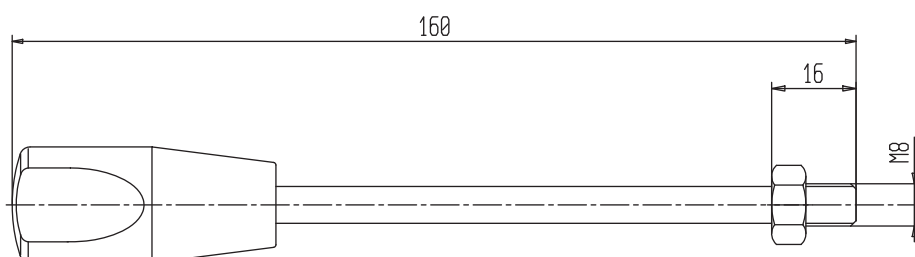


SL Part number R24187650



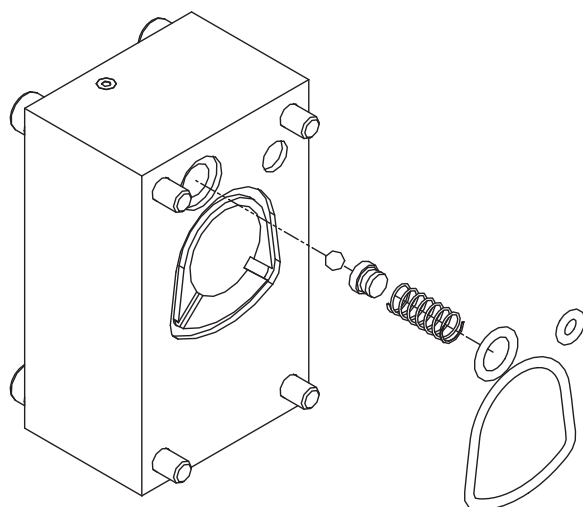
NL-FL Part number R24187651

Kit Shaft Part number R20192000

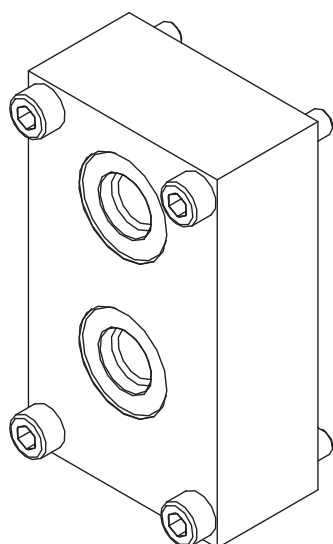


E0.241.0613.05.00IM01

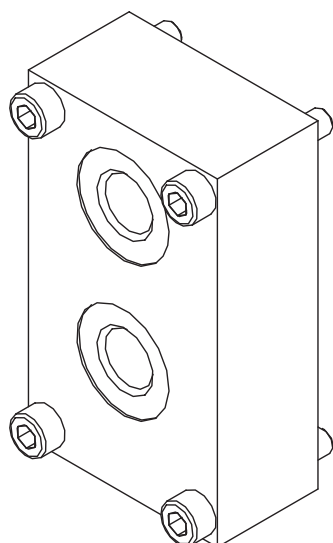
SPOOL POSITIONING



C2 Part number R24175093

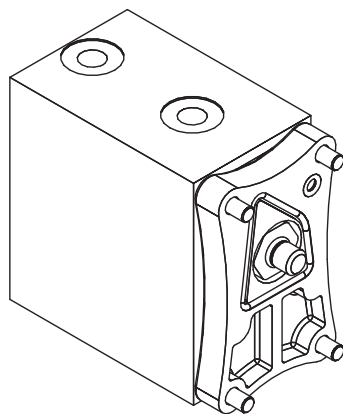


IP Part number R24175650 - GAS



IP Part number R24175640 - SAE

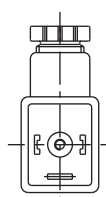
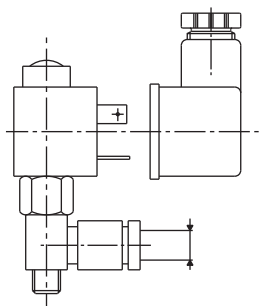
E0.241.0613.05.001M01

SPOOL POSITIONING**PP - PROPORTIONAL CONTROL**

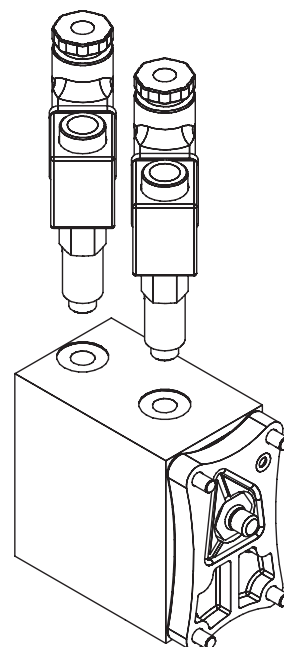
Part number - R24175675

P1-P2 ON/OFF CONTROL

Starting from PP/PO adding the electro-valves you get P1 or P2



Connector DIN 43650 - A/ISO 4400



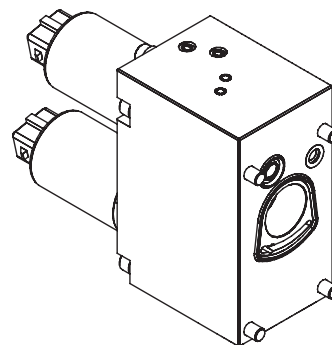
Part number - R24102710 with electro-valves 12Vdc for P1

Part number - R24102720 with electro-valves 24Vdc for P2

EO.241.0613.05.001M01

SPOOL POSITIONING

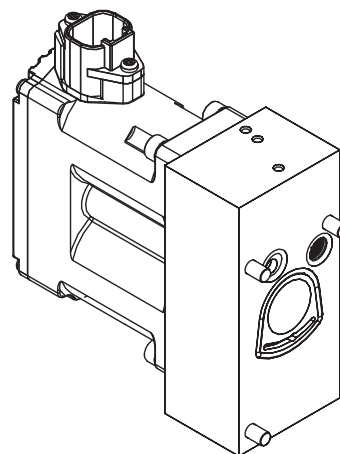
KE1-KE2 PROPORTIONAL / ON-OFF CONTROL



KE1-PROPORTIONAL ELECTRONIC CONTROL 12Vdc Part number R24103030

KE2-PROPORTIONAL ELECTRONIC CONTROL 24Vdc Part number R24103040

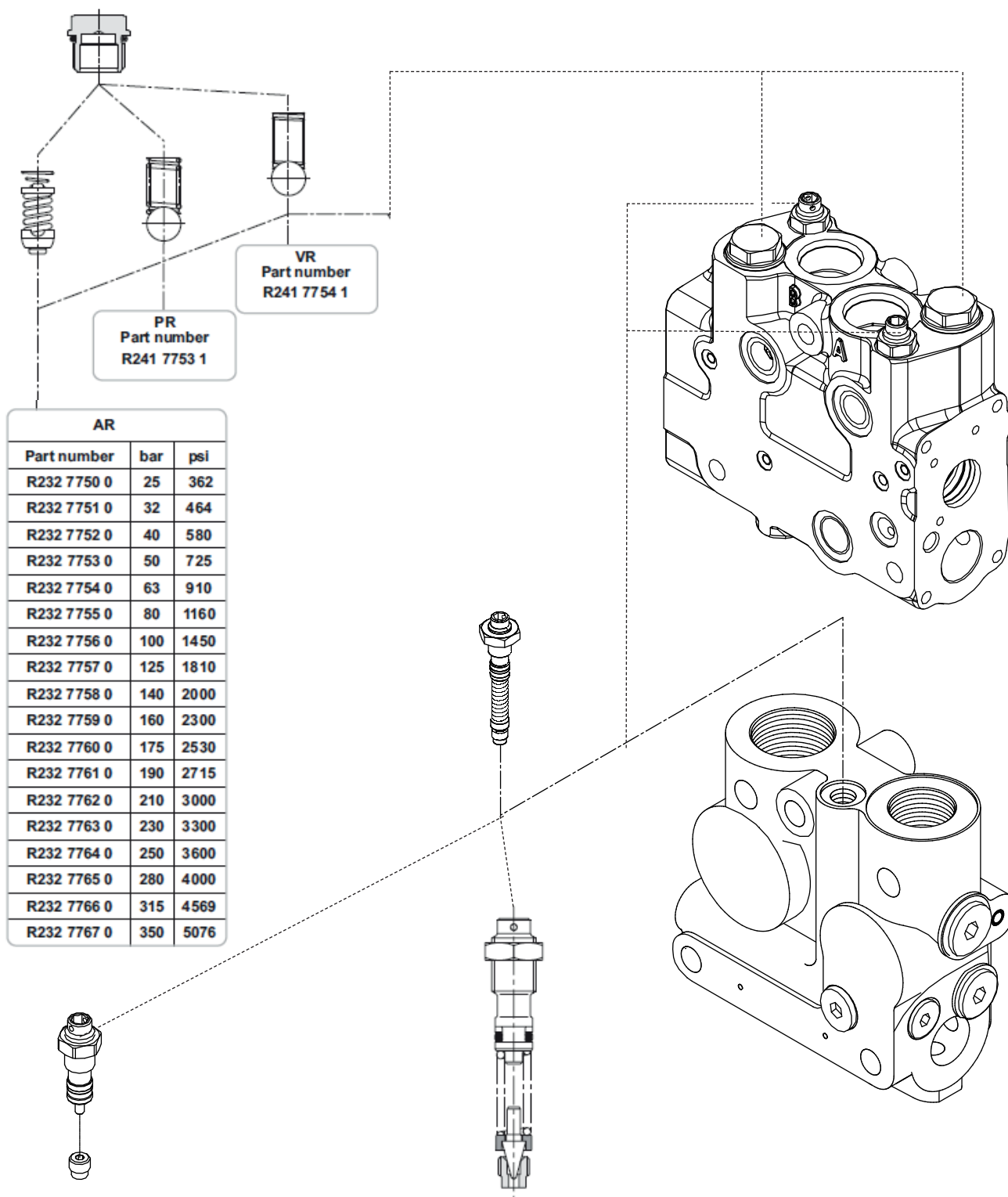
KM PROPORTIONAL CONTROL



**KM-CLOSED LOOP PROPORTIONAL ELECTRONIC CONTROL
Part number R24102650**

E0.241.0613.05.001M01

AVAILABLE VALVE TYPES ON A/B PORTS



NOTES

[illegible]

JEC

Joysticks Electronic Controls Hall Effect

SECTION C - Technical Catalogue



IE.362.0613.02.001M00

CARATTERISTICHE GENERALI
GENERAL FEATURES

Il Joystick Heavy Duty Multi-Axis è stato progettato per soddisfare le esigenze di molteplici applicazioni in cui è necessario avere un'interfaccia operatore intuitiva ed affidabile per il comando di macchine operatrici.

Il prodotto è in grado di funzionare in situazioni operative caratterizzate da basse e alte temperature, vibrazioni ed è costituito da protezioni contro l'acqua, conforme alle direttive EMC tipiche del settore.

L'uso dei sensori ad effetto Hall, che eliminano qualsiasi contatto tra parti elettriche mobili, migliora la risoluzione complessiva, la precisione e il numero di cicli lavorativi. I dispositivi ad effetto Hall sono immuni da polvere, sporcizia, fango e acqua. Queste caratteristiche rendono i dispositivi ad effetto Hall migliori per il rilevamento della posizione rispetto a mezzi alternativi, quali rilevamento ottico ed elettromeccanico.

Il sistema JEC esegue il controllo elettronico a distanza di distributori elettro-idraulici e l'installazione e taratura risultano molto semplici.

Una efficiente circuiteria interna al joystick fornisce segnali di controllo On-Off, proporzionali e CANbus, garantisce la massima controllabilità di qualsiasi tipo di sistema elettro-idraulico.

Tipi di Joysticks che Salami è in grado di fornire:

1. Joystick con pilotaggio PWM che può comandare, attraverso un segnale di corrente modulato attraverso la tecnica PWM, direttamente gli attuatori idraulici diventando l'unico controllo dell'intera macchina.
2. Joystick con segnale di uscita analogico (tipicamente nel range 0.5-4.5V). Viene usato quando c'è già una unità di elaborazione centrale che permette di interfacciare il manipolatore al distributore elettro-idraulico.
3. Joystick con uscita CAN-bus in grado di collegare un gran numero di comandi e di trasmetterli in remoto utilizzando il protocollo CAN-bus. Come nel caso 2, necessita di un dispositivo elettronico che "traduca" i messaggi di comando inviati al distributore elettro-idraulico.

I sistemi JEC possono essere forniti con cablaggi e kit di connettori standard.

The Heavy Duty Multi-Axis Hall Effects Joysticks has been designed to satisfy the needs of many applications in which it is necessary to have an intuitive and reliable operator interface for the control of machines.

The product is able to operate in operating conditions characterized by low and high temperatures, vibrations and it is constituted by water protection, compliance with the EMC directives, typical of the sector.

The use of the Hall Effect sensors, which eliminates any contact between moving electrical parts, improves overall resolution, precision and the number of working cycles.

Hall effect devices are immune to dust, dirt, mud, and water. These characteristics make Hall effect devices better for position sensing than alternative means such as optical and electromechanical sensing.

The JEC system performs the electronic remote control of electro-hydraulic directional control valve and the installation and calibration are very easy.

An efficient internal circuitry to the joystick provides On-Off, proportional and CANbus control signals, guarantees the highest controllability of any type of electro-hydraulic system.

Types of Joysticks that Salami is able to provide:

1. *Joystick with PWM driving that can command, through a current signal modulated by the PWM technique, the hydraulic actuators directly becoming the only control of the entire machine.*
2. *Joystick with analog output signal (typically in the range 0.5 - 4.5V). It is used when there is already a central processing unit that allows to interface the manipulator to the electro-hydraulic directional control valve.*
3. *Joystick with CAN-BUS output that can connect a large number of commands and transmit them remotely using the CAN-BUS protocol. As in the case 2, it needs an electronic device that "translate" command messages sent to the electro-hydraulic directional control valve.*

The JEC systems can be supplied with standard wire harnesses and connector kits.



INFORMAZIONI PER L'ORDINE ORDERING INFORMATION

[illegible]

PULSANTE UOMO MORTO DEAD MAN PUSH BUTTON	CONFIGURAZIONE PIASTRA POSTERIORE CONFIGURATION BACK PLATE PS = Posteriore Standard / Standard Back Da 00 a 02 = Configurazioni Standard / From 00 to 02 = Standard Configurations PP = Posteriore Personalizzato / Customized Back Da 03 a 99 = Configurazioni Personalizzate / From 03 to 99 = Customized Configurations
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**ALIMENTAZIONE ELET-
TROVALVOLE
ELECTROVALVES SUPPLY**

CONFIGURAZIONE PIASTRA FRONTALE
CONFIGURATION FRONT PLATE

FS = Frontale Standard /
Standard Front

Da 00 a 10 = Configurazioni Standard /
From 00 to 10 = Standard Configurations

FP = Frontale Personalizzato /
Customized Front

Da 11 a 99 = Configurazioni Personalizzate /
From 11 to 99 = Customized Configurations

BASE BASE	MOVIMENTO MOVEMENT	GIUNTO JOINT
P = PWM	1 = Singolo asse, bidirezionale / Single axis, bi-directional	D = Dritto / Straight
A = Analogica / Analog	2 = Due assi, a croce / Dual axes, cross movement	I = Inclinato / Inclined
C = CANbus	3 = Due assi, lungo tutte le diagonali / Dual axes, all diagonals	
M = Meccanica / Mechanical	0 = Inserire "0" in caso di scelta "M" e specificare il tipo di filetto (standard: M14x1.5, speciale: M12x1.75). Enter "0" in the case of choice "M" specify the type of thread (standard: M14x1.5, special: M12x1.75).	

SCELTA DELLA CONFIGURAZIONE DEL KIT CAVI CHOISE OF CABLES KIT CONFIGURATION	
S = Cavo di lunghezza Standard 25 cm / Cable with Standard length 25 cm	000 = senza kit cavi / D = Deutsch without cable kit
L = Cavo di lunghezza Personalizzata / Cable with Customized length	X00 = x00 cm / A = AMP Junior Timer
Si accettano solo lunghezze multiple di 1 m La lunghezza standard è 3 m / Permitted only multiple lengths of 1 m The standard length is 3 m /	
I = ISO 4400 - DIN 43650	
F = Fili volanti / Flying leads	
0 = se kit cavi non presente if there isn't cable kit	

CONFIGURAZIONI STANDARD PROPOSTE PROPOSED STANDARD CONFIGURATIONS

Di seguito vengono proposte cinque configurazioni standard di joysticks PWM, biassi e con movimento lungo tutte le diagonali (ciò permette di inviare al distributore elettroidraulico due segnali proporzionali contemporaneamente).

I manipolatori elettronici elencati di seguito permettono di pilotare in modo proporzionale o ON-OFF, attraverso segnali di corrente, un distributore elettroidraulico composto da più sezioni meccaniche (in particolare il VDP08) direttamente, senza la necessità di interporre alcun dispositivo tra il joystick e il distributore.

Il comando manuale dell'operatore si trasforma in comando elettronico attraverso un'opportuna sensoristica interna al joystick ad effetto Hall.

Il sistema joystick-distributore elettroidraulico funziona correttamente semplicemente collegando il kit cavi opportuno, uscente dal joystick, ai connettori delle elettrovalvole alloggiato sul distributore e fornendo l'alimentazione (12 o 24V) al manipolatore elettronico, il quale trasferisce la corrente necessaria per funzionare alle elettrovalvole.

Below are proposed five standard joysticks PWM configurations, dual axis and with movement along all diagonals (this allows you to send two proportional signals to the electro-hydraulic directional control valve at the same time).

The electronic manipulators below listed allow you to drive in proportional or ON-OFF mode, through current signals, an electro-hydraulic directional control valve consists of several mechanical sections (in particular the VDP08) directly, without the necessity to interpose any device between the joystick and the directional control valve. The manual command is transformed into electronic control through an appropriate sensoristics inside the Hall effect joystick.

The joystick electro-hydraulic directional control valve system working correctly simply by connecting the appropriate cable kit, coming out from the joystick, to the connectors of the solenoid valves housed on directional control valve and providing the power supply (12 or 24V) to the electronic manipulator, which transfers the current required to operate at solenoid valves..



CODICE PER L'ORDINE: JEC-P3D-N-FS00-PS00-S0000-12
PART NUMBER: 7362PN000

CODICE PER L'ORDINE: JEC-P3D-N-FS00-PS00-S0000-24
PART NUMBER: 7362PN001

La prima configurazione standard di joystick biasse con base PWM e movimento lungo tutte le diagonali è priva di pulsanti ON-OFF e rollers proporzionali. Il joystick permette di pilotare proporzionalmente, attraverso quattro segnali di corrente PWM, un distributore elettroidraulico composto da due sezioni meccaniche.

ORDERING CODE: JEC-P3D-N-FS00-PS00-S0000-12
PART NUMBER: 7362PN000

ORDERING CODE: JEC-P3D-N-FS00-PS00-S0000-24
PART NUMBER: 7362PN001

The first standard dual axis joystick configuration with PWM base and with movement along all diagonals is devoid of ON-OFF buttons and proportional rollers. The joystick allows to control proportionally, by means of four PWM current signals, a directional control valve consisting of two electro-mechanical sections.

CODICE PER L'ORDINE: JEC-P3D-N-FS02-PS00-S0000-12
PART NUMBER: 7362PN002

CODICE PER L'ORDINE: JEC-P3D-N-FS02-PS00-S0000-24
PART NUMBER: 7362PN003

La seconda configurazione standard di joystick biasse con base PWM e movimento lungo tutte le diagonali possiede tre pulsanti ON-OFF.

Il joystick permette di pilotare proporzionalmente, attraverso quattro segnali di corrente PWM, un distributore elettroidraulico composto da due sezioni meccaniche, con la possibilità di eseguire anche tre comandi ON-OFF.

ORDERING CODE : JEC-P3D-N-FS02-PS00-S0000-12
PART NUMBER: 7362PN002

ORDERING CODE : JEC-P3D-N-FS02-PS00-S0000-24
PART NUMBER: 7362PN003

The second standard dual axis joystick configuration with PWM base and with movement along all diagonals has three ON-OFF buttons. The joystick allows to control proportionally, by means of four PWM current signals, a directional control valve consisting of two electro-mechanical sections, with the possibility to perform also three ON-OFF commands



CONFIGURAZIONI STANDARD PROPOSTE

PROPOSED STANDARD CONFIGURATIONS



CODICE PER L'ORDINE: JEC-P3D-N-FS04-PS00-S0000-12

PART NUMBER: 7362PN004

CODICE PER L'ORDINE: JEC-P3D-N-FS04-PS00-S0000-24

PART NUMBER: 7362PN005

La terza configurazione standard di joystick biasse con base PWM e movimento lungo tutte le diagonali possiede sei pulsanti ON-OFF.

Il joystick permette di pilotare proporzionalmente, attraverso quattro segnali di corrente PWM, un distributore elettroidraulico composto da due sezioni meccaniche, con la possibilità di eseguire anche sei comandi ON-OFF.

ORDERING CODE: JEC-P3D-N-FS04-PS00-S0000-12

PART NUMBER: 7362PN004

ORDERING CODE: JEC-P3D-N-FS04-PS00-S0000-24

PART NUMBER: 7362PN005

The third standard dual axis joystick configuration with PWM base and with movement along all diagonals has six ON-OFF buttons.

The joystick allows to control proportionally, by means of four PWM current signals, a directional control valve consisting of two electro-mechanical sections, with the possibility to perform also six ON-OFF commands

CODICE PER L'ORDINE: JEC-P3D-N-FS07-PS00-S0000-12

PART NUMBER: 7362PN006

CODICE PER L'ORDINE: JEC-P3D-N-FS07-PS00-S0000-24

PART NUMBER: 7362PN007

La quarta configurazione standard di joystick biasse con base PWM e movimento lungo tutte le diagonali possiede due pulsanti ON-OFF e un rocker ON-OFF-ON.

Il joystick permette di pilotare proporzionalmente, attraverso quattro segnali di corrente PWM, un distributore elettroidraulico composto da due sezioni meccaniche, con la possibilità di eseguire anche due comandi ON-OFF standard (con ritorno a molla). È inoltre presente un rocker per un comando ON-OFF-ON con ritenuta.

ORDERING CODE : JEC-P3D-N-FS07-PS00-S0000-12

PART NUMBER: 7362PN006

ORDERING CODE : JEC-P3D-N-FS07-PS00-S0000-24

PART NUMBER: 7362PN007

The fourth standard dual axis joystick configuration with PWM base and with movement along all diagonals has two ON-OFF buttons and a rocker ON-OFF-ON.

The joystick allows to control proportionally, by means of four PWM current signals, a directional control valve consisting of two electro-mechanical sections, with the possibility to perform also two ON-OFF standard commands (with spring return).

There is also a rocker for an ON-OFF-ON with latch.



CONFIGURAZIONI STANDARD PROPOSTE
PROPOSED STANDARD CONFIGURATIONS

**CODICE PER L'ORDINE: JEC-P3D-N-FS10-PS00-S0000-12****PART NUMBER: 7362PN008****CODICE PER L'ORDINE: JEC-P3D-N-FS10-PS00-S0000-24****PART NUMBER: 7362PN009**

La quinta configurazione standard di joystick biasse con base PWM e movimento lungo tutte le diagonali possiede due pulsanti ON-OFF e un roller proporzionale.

Il joystick permette di pilotare proporzionalmente, attraverso quattro segnali di corrente PWM, un distributore elettroidraulico composto da due sezioni meccaniche, con la possibilità di eseguire anche due comandi ON-OFF.

La presenza del roller proporzionale permette di generare due ulteriori segnali di corrente PWM e quindi di pilotare proporzionalmente un'ulteriore sezione meccanica del distributore elettroidraulico.

Nell'impugnatura è presente un driver PWM preregolato con le impostazioni di fabbrica, registrabile manualmente. Per fare ciò bisogna smontare l'impugnatura.

ORDERING CODE : JEC-P3D-N-FS10-PS00-S0000-12**PART NUMBER: 7362PN008****ORDERING CODE : JEC-P3D-N-FS10-PS00-S0000-24****PART NUMBER: 7362PN009**

The fifth standard dual axis joystick configuration with PWM base and with movement along all diagonals has two ON-OFF buttons and a proportional roller.

The joystick allows to control proportionally, by means of four PWM current signals, a directional control valve consisting of two electro-mechanical sections, with the possibility to perform also six ON-OFF commands.

The presence of the roller allows to generate other two proportional PWM current signals and therefore to control proportionally an additional mechanical section of the electro-hydraulic directional control valve.

In the handle there is a PWM driver with preset factory settings, manually adjustable. To do this you must dismount the handle.



SPECIFICHE TECNICHE DELLE BASI DEL JOYSTICK
TECHNICAL SPECIFICATIONS OF THE JOYSTICK BASE

SPECIFICHE MECCANICHE

- Materiale del corpo principale: alluminio
- Angolo di deflessione della leva: $\pm 22^\circ \pm 1^\circ$
- Angolo elettrico: $\pm 22^\circ \pm 1^\circ$
- Temperatura di esercizio: $-25^\circ\text{C} / + 80^\circ\text{C}$
- Classe di protezione (sopra il pannello): fino a IP 67
- Vita: > 5 milioni di cicli

MECHANICAL SPECIFICATIONS

- Main body material: aluminium
- Lever deflection angle: $\pm 22^\circ \pm 1^\circ$
- Electrical angle: $\pm 22^\circ \pm 1^\circ$
- Operating temperature range: $-25^\circ\text{C} / + 80^\circ\text{C}$
- Protection class (above panel): up to IP 67
- Life: > 5 million cycles

SPECIFICHE ELETTRICHE

- Sensore: tecnologia senza contatto Effetto Hall
- Tensione di alimentazione: 8 - 32V
- Consumo di corrente @ riposo: 25 mA (solo sensore)
- Configurazione del segnale di uscita: vedi pagine seguenti per tutte le versioni
- Tipo di connettore: Deutsch DT04-12P

ELECTRICAL SPECIFICATIONS

- Sensor: Hall Effect contactless technology
- Supply voltage: 8 - 32V
- Current consumption @ rest: 25 mA (sensor only)
- Output Signal configuration: see next pages for all versions
- Connector type: Deutsch DT04-12P



JOYSTICK CON BASE PWM

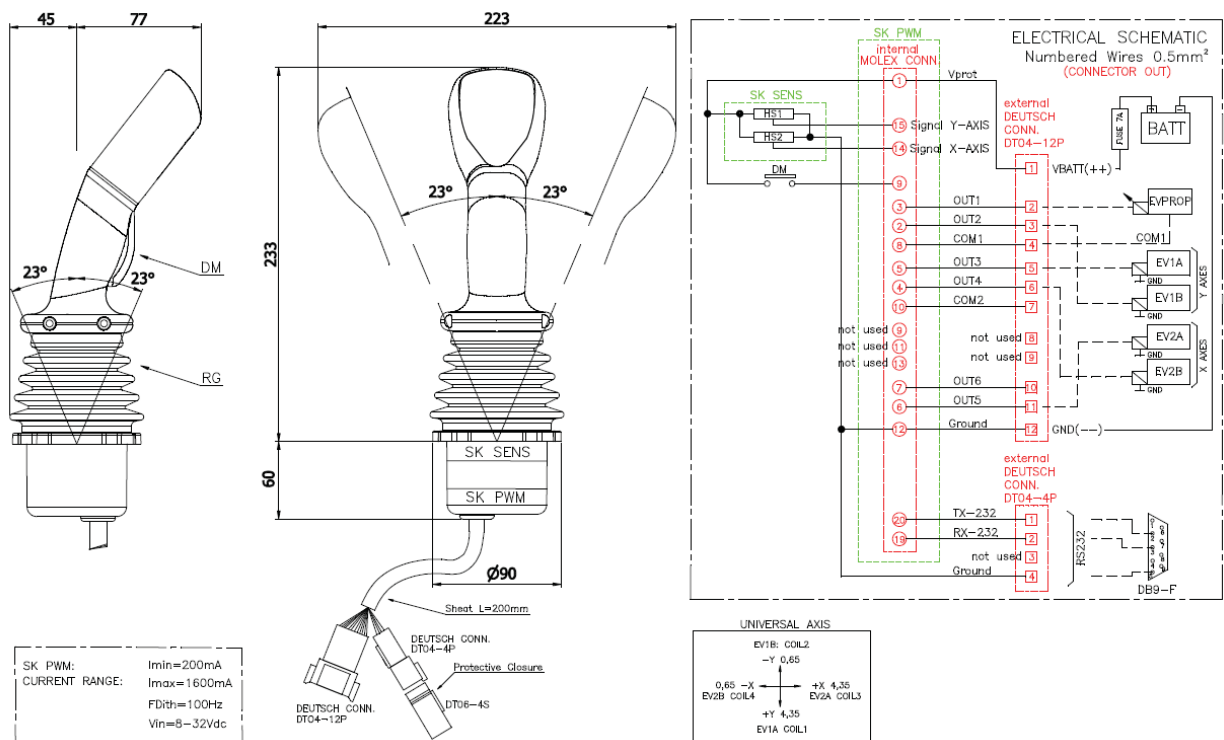
JOYSTICK WITH PWM BASE

SPECIFICHE ELETTRICHE

- Tensione di alimentazione: 8 - 32 Vdc
- Consumo di corrente @ riposo: 250 mA
- Sensore: tecnologia senza contatto Effetto Hall
- Uscita PWM: 2 coppie di elettrovalvole proporzionali
- Intervallo corrente di uscita (PWM): da 100 a 1600 mA
- Frequenza del Dither: da 60 a 250 Hz (100 Hz di fabbrica)

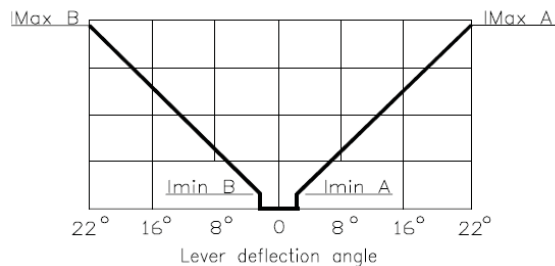
ELECTRICAL SPECIFICATIONS

- Supply voltage: 8 - 32 Vdc
- Current consumption @ rest: 250 mA
- Sensor: Hall Effect contactless technology
- PWM output : 2 x dual prop. solenoid valves
- Current output range (PWM): from 100 to 1600 mA
- Dither frequency: from 60 to 250 Hz (100 Hz factory preset)



JOYSTICK CON BASE PWM PER IL COMANDO DI DUE SEZIONI MECCANICHE
CODICE PER L'ORDINE: JEC-P3D-Y-FS00-PS00-S0000-12

JOYSTICK WITH PWM BASE FOR THE CONTROL OF TWO SECTIONS MECHANICAL
ORDERING CODE: JEC-P3D-Y-FS00-PS00-S0000-12



Attivazione delle uscite Imin e digitali: tra 2° e 5°
Imin and digital outputs activation: between 2° and 5°

CURVA DI CONTROLLO DEL SEGNALE DI USCITA
OUTPUT SIGNAL CONTROL CURVE

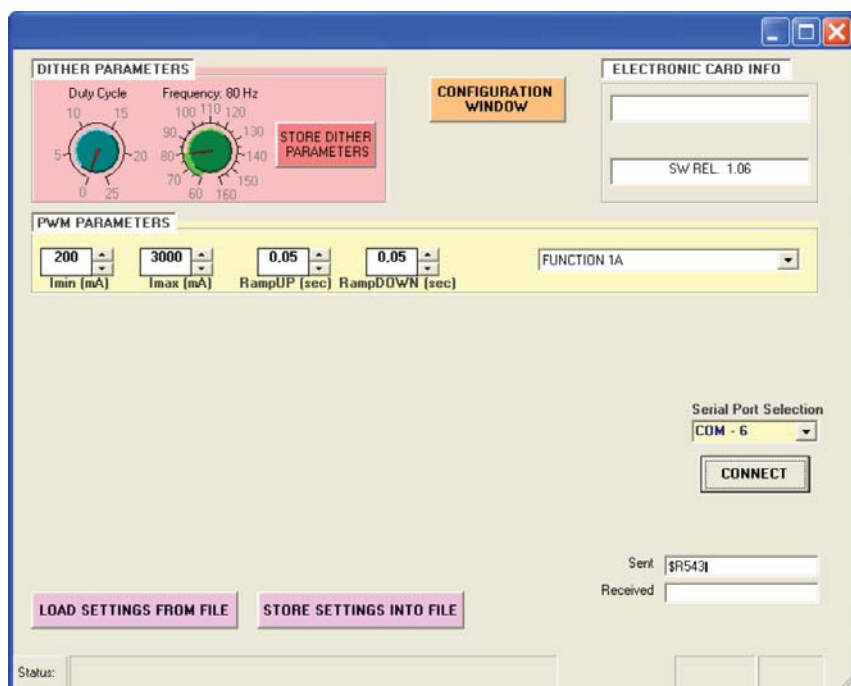
JOYSTICK CON BASE PWM
JOYSTICK WITH PWM BASE

PARAMETRI REGOLABILI

I parametri della scheda elettronica che genera i segnali PWM, alloggiata all'interno della medesima base del joystick, sono regolabili tramite la linea seriale RS232 con uno specifico strumento di calibrazione e configurazione.

ADJUSTABLE PARAMETERS

The following parameters are adjustable via RS232 serial line by means of a specific calibration and configuration tool.



Con l'utilizzo della finestra di calibrazione è possibile modificare i seguenti parametri di funzionamento:

- Imin, Imax, rampe, duty cycle, dither.

By use of the calibration window you can change the following parameters:

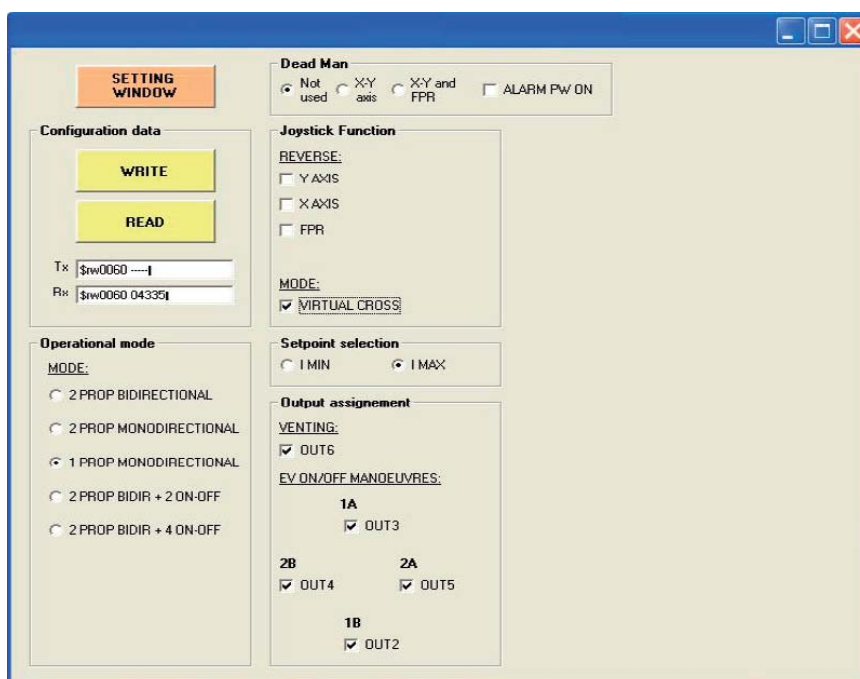
- operating parameters: Imin, Imax, ramps, duty cycle, dither.

Con l'utilizzo della finestra di configurazione è possibile modificare i seguenti parametri:

- modalità di funzionamento;
- abilitazione del pulsante di uomo morto;
- funzioni joystick;
- selezione del valore di riferimento;
- assegnazione uscita delle valvole ausiliarie on-off.

By use of the configuration window you can change the following parameters:

- operation mode;
- deadman push button enable;
- joystick functions;
- setpoint selection;
- output assignment on-off auxiliary valves.



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JOYSTICK CON BASE PWM JOYSTICK WITH PWM BASE

I joysticks possono essere forniti con il relativo kit cavi, in cui è possibile scegliere il tipo di connettore, attraverso il quale esso si collega alle elettrovalvole situate sul distributore elettroidraulico, e la lunghezza dei cavi, opportunamente pensati per lavorare nei settori in cui i distributori sono utilizzati.

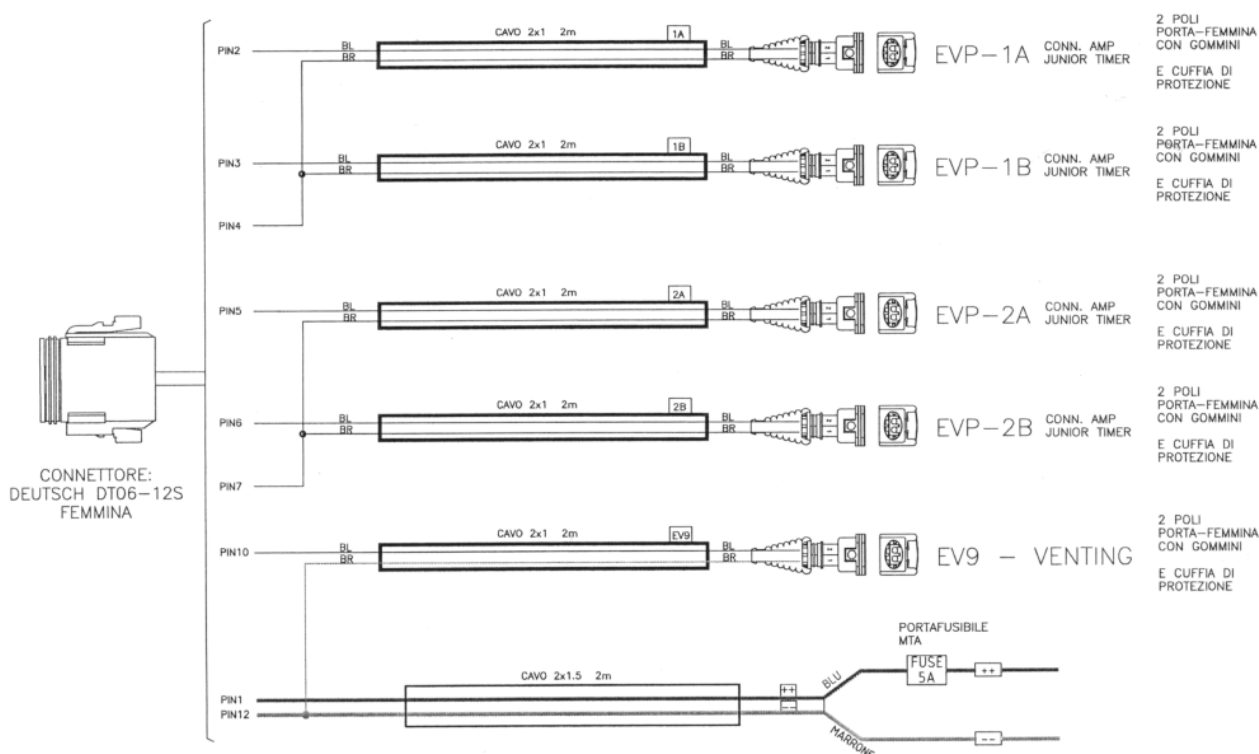
L'esempio raffigurato nella figura sottostante descrive un tipico kit cavi che si interpone e realizza il collegamento tra il joystick elettronico PWM (il quale è sempre provvisto di fili uscenti di lunghezza 20-25 cm connessi ad connettore deuth DT04-12P maschio) e le elettrovalvole, attraverso dei connettori AMP Junior Timer.

Questa configurazione di joystick PWM permette di comandare due sezioni meccaniche (attraverso quattro segnali PWM che pilotano quattro elettrovalvole), ed il comando è inviato al distributore solo se il pulsante di uomo morto (che consiste in un contatto normalmente aperto) viene tenuto premuto dall'operatore; diversamente non si ha alcun passaggio di corrente e l'intero sistema rimane a riposo.

The joysticks can be delivered with its cable kit, in which you can choose the connector type, through which it connects to the valves located on the electro-hydraulic directional control valve, and the cables length, properly designed to work in areas where directional control valves are used.

The example depicted in the figure below describes a typical cable kit which interposes and realizes the connection between the electronic PWM joystick (which is always provided with a length of 20-25 cm outgoing wires connected to the deuth DT04-12P male connector) and the solenoid valves, by AMP Junior Timer connectors.

This configuration of PWM joystick allows you to control two mechanical sections (by means of four PWM signals driving four solenoid valves), and the command is sent to the directional control valves only if the dead man button (which is a normally open contact) is held down by operator; otherwise you have no current flow and the entire system is at rest.



ESEMPIO KIT CAVI PER CONFIGURAZIONE JOYSTICK JEC-P3D-Y-FS00-PS00-L200A-24
CABLE KIT EXAMPLE FOR JOYSTICK CONFIGURATION: JEC-P3D-Y-FS00-PS00-L200A-24

PART NUMBER DEL KIT CAVI: 7362K3IA2
CABLE KIT PART NUMBER: 7362K3IA2

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JOYSTICK CON BASE PWM
JOYSTICK WITH PWM BASESISTEMA COMPLETO JOYSTICK P3D-Y-FS00-PS00-L300A-24 / KIT CAVI
COMPLETE SYSTEM JOYSTICK P3D-Y-FS00-PS00-L300A-24 / CABLE KIT

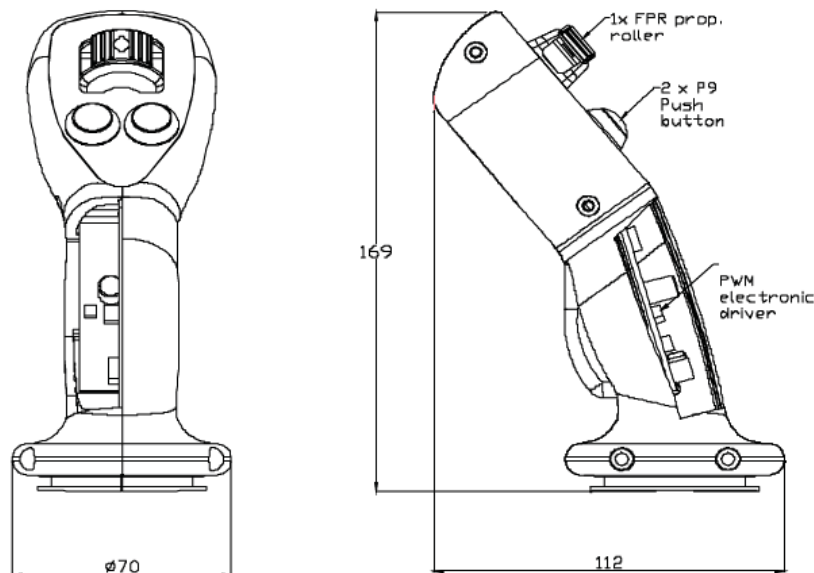
Per il Joystick PWM esiste, come già detto, la possibilità di impostare alcuni parametri via software. Ciò è possibile farlo attraverso un CD contenente il programma (con relativo manuale d'uso) e un apposito cavo (vedi figura sottostante); non rappresenta lo standard di vendita del sistema JEC e deve essere richiesto espressamente in fase d'ordine.

For the Joystick PWM exists, as already mentioned, the option of setting some parameters via software. you can make it through a CD containing the program (with its user guide), and a special cable (see figure below); it does not represent the standard of sales system JEC and must be specifically requested at time of order and.

CAVO DI PROGRAMMAZIONE ATTRAVERSO LINEA SERIALE RS232
PART NUMBER: 7362RS000
PROGRAMMING CABLE VIA SERIAL LINE RS232
PART NUMBER: 7362RS000

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JOYSTICK CON BASE PWM JOYSTICK WITH PWM BASE



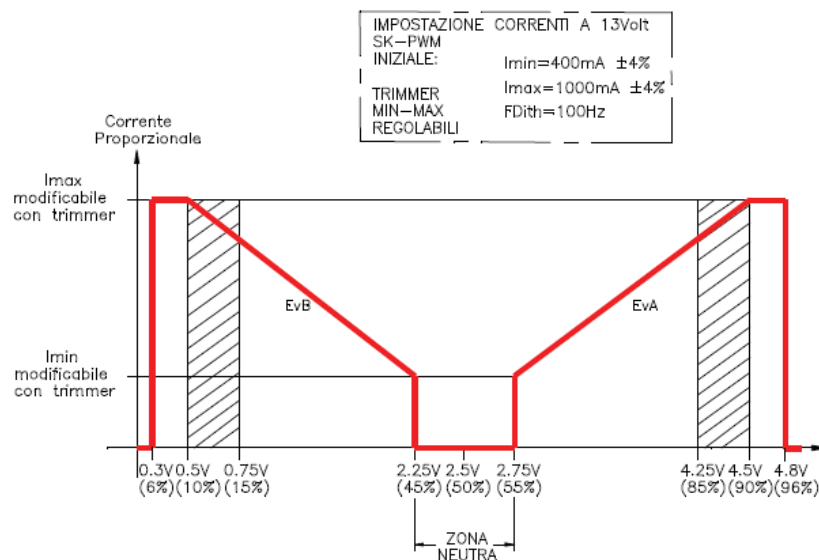
DRIVER PWM INTERNO PER TERZA FUNZIONE PROPORZIONALE
INTERNAL PWM DRIVER FOR THIRD PROPORTIONAL FUNCTION

SPECIFICHE ELETTRICHE

- Tensione: 8-32 Volt
- Max. assorbimento di corrente: 100 mA
- Intervallo della corrente di uscita: set di fabbrica tra 0 e 1500 mA
- PWM dithering frequenza: 100 Hz
- Temperatura di esercizio: -25 ° C / +85 ° C

ELECTRICAL SPECIFICATIONS

- Supply voltage: 8 - 32 Volt
- Max. current draw: 100 mA
- Current output range: Factory set between 0 and 1500 mA
- PWM dither frequency: 100 Hz
- Operating temperature range: -25°C/+85°C



CURVA DI CONTROLLO DEL SEGNALE DI USCITA DAL DRIVER PWM
OUTPUT SIGNAL CONTROL CURVE FROM PWM DRIVER

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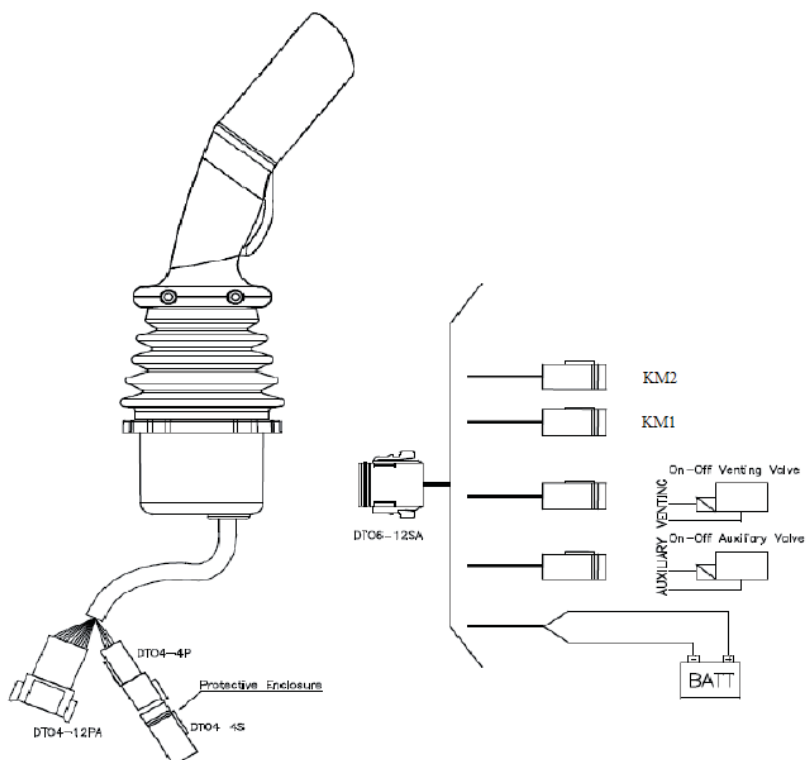
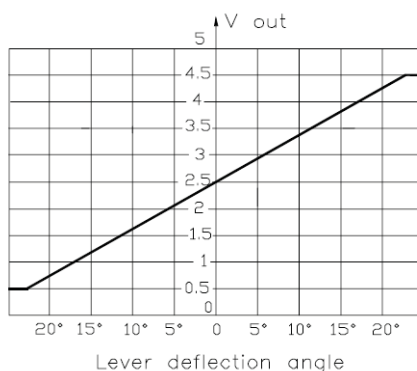
JOYSTICK CON BASE ANALOGICA
JOYSTICK WITH ANALOG BASE

SPECIFICHE ELETTRICHE

- Tensione di alimentazione: $8 \div 32 \text{ Vdc}$
- Consumo di corrente @ riposo: $< 25 \text{ mA}$ (solo sensore)
- Segnale di uscita @ riposo: $2,5 \text{ Vdc} \pm 0,2 \text{ V}$
- Portata del segnale in uscita: $0,5 \div 4,5 \text{ V} \pm 0,2 \text{ V}$ (vedi il grafico)
- Corrente di uscita nominale: 1 mA
- Protezioni: polarità sovratensione e inversione

ELECTRICAL SPECIFICATIONS

- Supply voltage: $8 \div 32 \text{ Vdc}$
- Current consumption @ rest: $< 25 \text{ mA}$ (sensor only)
- Signal output @ rest: $2.5 \text{ Vdc} \pm 0.2 \text{ V}$
- Output signal range: $0.5 \div 4.5 \text{ V} \pm 0.2 \text{ V}$ (see graph)
- Rated output current: 1 mA
- Protections: overvoltage and reversed polarity

JOYSTICK CON BASE ANALOGICA PER COMANDO TRE MODULI "KM" ANALOGICI
JOYSTICK WITH ANALOG BASE FOR THE CONTROL OF THREE ANALOG MODULES "KM"CURVA DI CONTROLLO DEL SEGNALE DI USCITA DALLA BASE ANALOGICA
OUTPUT SIGNAL CONTROL CURVE FROM ANALOG BASE

IE.362.0613.02.001M00

JOYSTICK CON BASE CANBUS
JOYSTICK WITH CANBUS BASE**SPECIFICHE ELETTRICHE**

- Tensione di alimentazione: 8-32 Vdc
- Consumo di corrente @ riposo: <250 mA
- Strato fisico: ISO 11898, 250kbit / s
- Protocollo: J1939 / CAN OPEN
- Tipo di connettore: Deutsch DT04-4P

Con il collegamento Canbus possono essere gestiti i seguenti segnali sull'impugnatura:

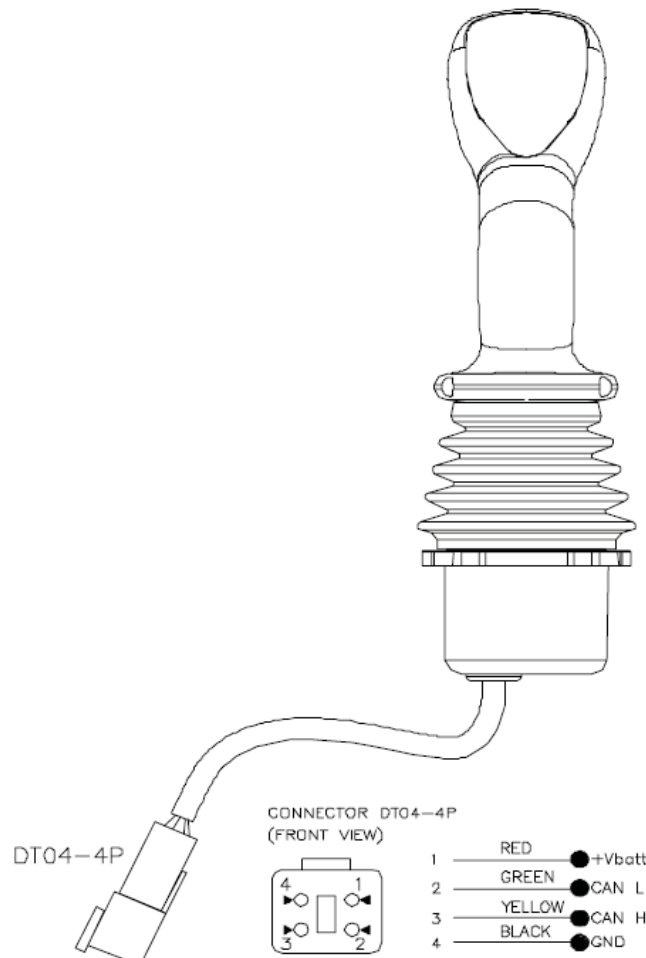
- 4 uscite digitali 0.7A (LED, bobine di arresto, cicalini, ecc)
- 6 ingressi analogici di tensione 0-5 V (rollers proporzionali)
- 6 ingressi digitali (pulsanti)

ELECTRICAL SPECIFICATIONS

- Supply voltage: 8 - 32 Vdc
- Current consumption @ rest: < 250 mA
- Physical layer: ISO 11898, 250Kbit/s
- Protocol: J1939/ CAN open
- Connector type: Deutsch DT04-4P

With Canbus link, following signals can be managed on the grip::

- 4 digital outputs 0.7A (LEDs, detent coils, buzzers, etc.)
- 6 analog voltage input 0-5 V (proportional rollers)
- 6 digital inputs (push buttons)



JOYSTICK CON BASE CANBUS
CODICE PER L'ORDINE: JEC-C3D-N-FS00-PS00-S0000-12

JOYSTICK WITH CANBUS BASE
ORDERING CODE: JEC-C3D-N-FS00-PS00-S0000-12

IE.362.0613.02.001M00



CONFIGURAZIONI STANDARD PIASTRA FRONTALE
FRONT PLATE STANDARD CONFIGURATIONS



VISTA FRONTALE IMPUGNATURA JOYSTICK
FRONT HANDLE JOYSTICK



CODICE PER L'ORDINE
ORDERING CODE

FS00



CODICE PER L'ORDINE
ORDERING CODE

FS01



CODICE PER L'ORDINE
ORDERING CODE

FS02



CODICE PER L'ORDINE
ORDERING CODE

FS03



CODICE PER L'ORDINE
ORDERING CODE

FS04



CODICE PER L'ORDINE
ORDERING CODE

FS05

IE.362.0613.02.00IM00

CONFIGURAZIONI STANDARD PIASTRA FRONTALE
FRONT PLATE STANDARD CONFIGURATIONS



VISTA FRONTALE IMPUGNATURA JOYSTICK
FRONT HANDLE JOYSTICK



CODICE PER L'ORDINE
ORDERING CODE

FS06



CODICE PER L'ORDINE
ORDERING CODE

FS07



CODICE PER L'ORDINE
ORDERING CODE

FS08



CODICE PER L'ORDINE
ORDERING CODE

FS09



CODICE PER L'ORDINE
ORDERING CODE

FS10

IE.362.0613.02.001M00

CONFIGURAZIONI STANDARD PIASTRA POSTERIORE
BACK PLATE STANDARD CONFIGURATIONS

**VISTA POSTERIORE IMPUGNATURA JOYSTICK SENZA E CON PULSANTE UOMO MORTO**
BACK HANDLE JOYSTICK WITHOUT AND WITH DEAD MAN BUTTON

CODICE PER L'ORDINE
ORDERING CODE

PS00



CODICE PER L'ORDINE
ORDERING CODE

PS01



CODICE PER L'ORDINE
ORDERING CODE

PS02

IE.362.0613.02.00IM00

ACCESSORI PER PERSONALIZZAZIONE JOYSTICK
ACCESSORIES FOR JOYSTICK CUSTOMIZATION

PULSANTE ON-OFF



- Amperaggio nominale fino a 5 A resistivi, fino a 3 A induttivi
- Vita operativa: > 100.000 cicli
- Colori disponibili: rosso, blu, giallo, nero, verde, bianco
- Classe di protezione: IP64
- Materiale del pulsante e della lunetta: termoplastica
- Contatti: lega di argento placcata in oro

ON-OFF PUSH BUTTON

- Rated amperage up to 5 A resistive, up to 3 A inductive
- Operational life: > 100,000 cycles
- Available colours: red, blue, yellow, black, green, white
- Protection Class: IP64
- Button and bezel material: thermoplastic
- Contacts: gold plated silver alloy

ROCKER ON-OFF-ON



- Contatti: argento placcato
- Amperaggio nominale:
 - 16 A / 250 VAC
 - 3 A / 24 VDC
- Durata elettrica: > 100.000 cicli
- Durata meccanica: > 3.000.000 di cicli
- Classe di protezione: IP54

ON-OFF-ON ROCKER

- Contacts: Silver Plated
- Rated amperage: 16 A / 250 VAC
 - 3 A / 24 VDC
- Electrical Life: > 100.000 cycles
- Mechanical Life: > 3.000.000 cycles
- Protection Class: IP54

PULSANTE UOMO MORTO

- Amperaggio nominale: fino a 3 A induttivi
- Classe di protezione (microinterruttore): IP67

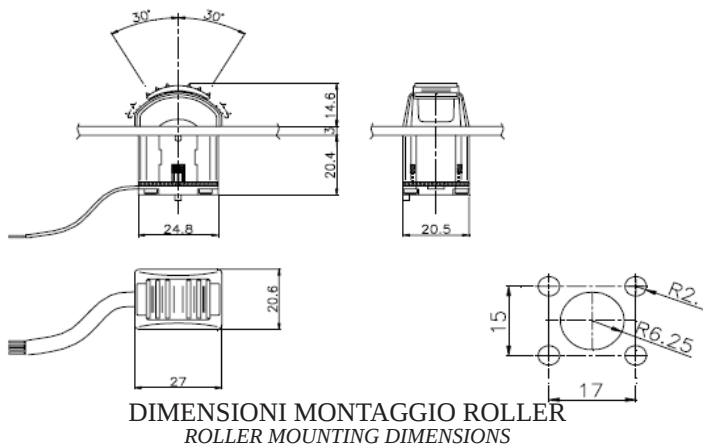
DEAD MAN PUSH BUTTON

- Rated amperage: up to 3 A inductive
- Protection Class (microswitch): IP67



IE.362.0613.02.001M00

ACCESSORI PER PERSONALIZZAZIONE JOYSTICK ACCESSORIES FOR JOYSTICK CUSTOMIZATION



DIMENSIONI MONTAGGIO ROLLER
ROLLER MOUNTING DIMENSIONS

ROLLER PROPORZIONALE CON SENSORE AD EFFETTO HALL

Specifiche meccaniche

- Angolo di rotazione: $\pm 30^\circ$
- Materiale del corpo: resina acetalica / teflon
- Colori disponibili: giallo, grigio, blu
- Materiale cuffia di gomma: EPDM / 35-45 - A
- Temperatura di esercizio: $-25^\circ\text{C} / +85^\circ\text{C}$
- Protezione ambientale: IP 68 (sopra il pannello)
- Vita: $> 5.000.000$ di cicli

Specifiche elettriche

- Tensione di alimentazione: 8-32 Vdc
- Assorbimento di corrente a riposo: 15 mA
- Segnale di uscita @ riposo: 2.5 Vdc $\pm 0.1\text{V}$
- Intervallo completo del segnale di uscita:
0,5 - 4,5 V, $\pm 0.2\text{V}$
- Corrente di uscita nominale: 1 mA

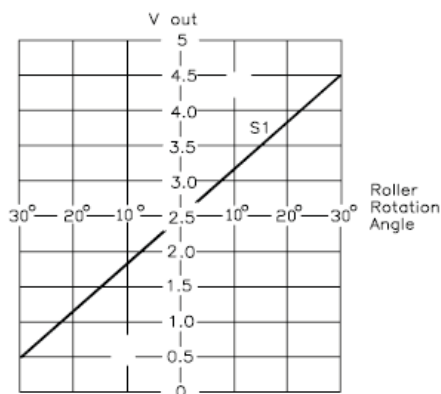
PROPORTIONAL ROLLER WITH HALL EFFECT SENSOR

Mechanical Specifications

- Rotation angle: $\pm 30^\circ$
- Body material: acetal resin / teflon
- Colours available: Yellow, grey, blue
- Rubber gaiter material EPDM / 35-45 shore - A
- Operating temperature range: $-25^\circ\text{C} / +85^\circ\text{C}$
- Environmental protection: IP 68 (above panel)
- Life: $> 5.000.000$ cycles

Electrical Specifications

- Supply voltage: 8-32 Vdc
- Current consumption at rest: 15 mA
- Signal output @ rest: 2.5 Vdc $\pm 0.1\text{V}$
- Full output signal range:
0.5 - 4.5 V, $\pm 0.2\text{V}$
- Rated output current: 1 mA



CURVA DI CONTROLLO DEL SEGNALE DI USCITA
OUTPUT SIGNAL CONTROL CURVE

IE.362.0613.02.001M00

NOTES

IE.362.0613.02.001M00



**You can find our most up to date “STANDARD SALES CONDITIONS” on our website
www.salami.it.**

**Potete trovare le nostre più aggiornate “CONDIZIONI DI VENDITA STANDARD” sul nostro sito
www.salami.it.**

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You can watch our tutorials on youtube channel



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