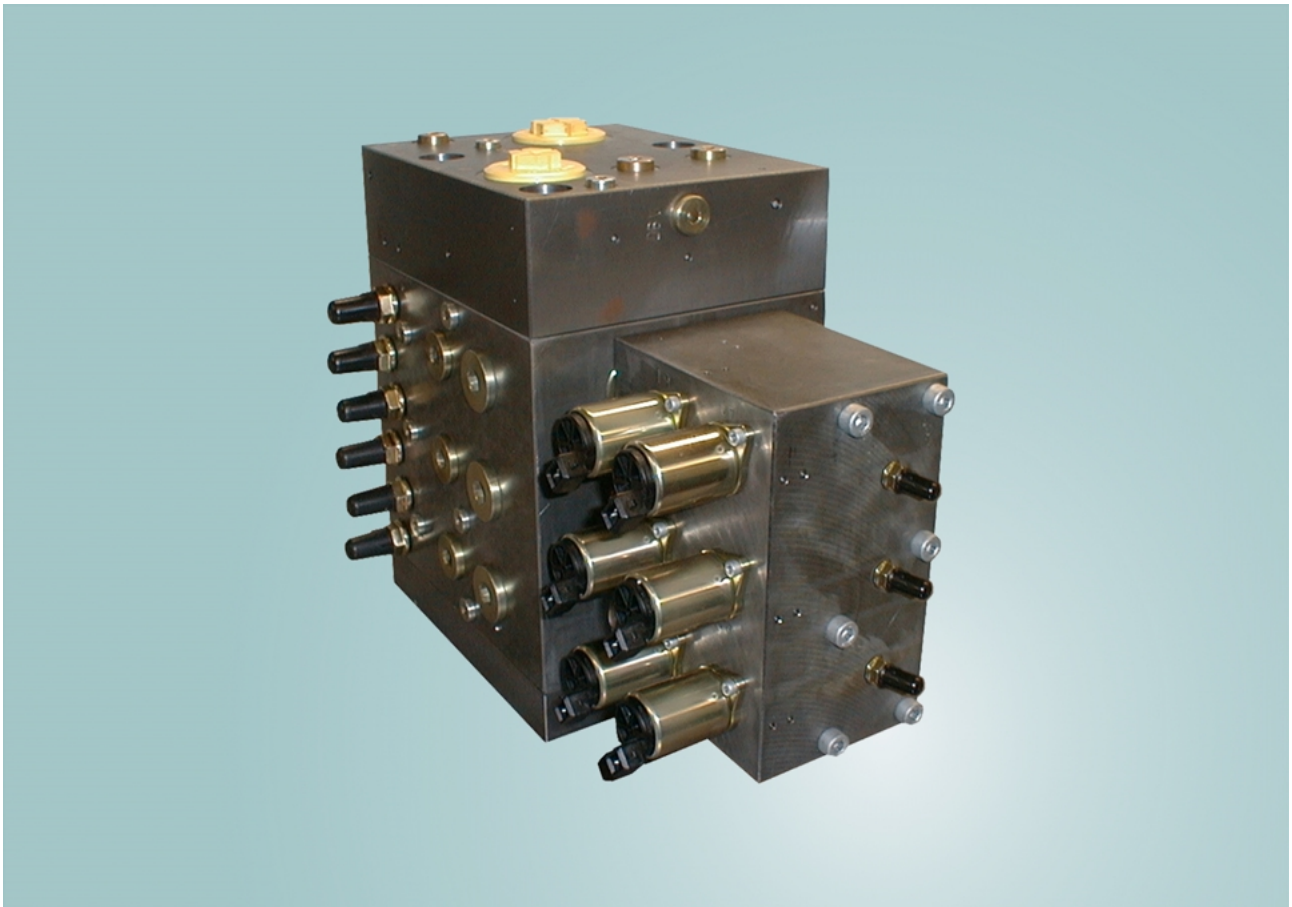


**Safety for Hydraulics**  
Proportional valve in sandwich design series LV22



**motion and progress**

## Contents

## Page

1.	General description .....	3
2.	Technical data .....	3
2.1	General characteristic data .....	3
2.2	Hydraulic characteristic data .....	3
2.3	Port sizes .....	4
2.4	Characteristic data for proportional electrical actuation .....	4
2.5	Characteristic data for hydraulic actuation .....	4
3.	Diagrams .....	5
3.1	Flow characteristic P-A/B .....	5
3.2	Control characteristic .....	5
3.3	Pressure difference at main spool at 100% stroke .....	5
3.4	Pressure difference at main spool in neutral position .....	6
4.	Circuit diagram .....	6
5.	Measurements .....	7
6.	Type code .....	8
6.1	Structure of the type code .....	8
6.2	Legend of the type code .....	9

## 1. General description

Bucher's sandwich-type proportional valves control the volumetric flow internal to the actuator. A load-independence will be achieved by individual pressure compensators which are assigned to each proportional directional control valve (load-sensing).

The valve system consists of the inlet module, 2 to 8 actuator sections and

the end module. The flexible modular system enables the setup to be adapted perfectly to the respective application.

This will be achieved by:

- inlet module variants,

- modular plates with individual pressure compensator and individual adjustable primary pressure relief,
- various actuating methods.

The complete valve type will be defined by the type code (page 6, para 6).

## 2. Technical data

### 2.1 General characteristic data

Design	spool valve
Actuation	electrical piloted hydraulic combined electrical piloted /hydraulic
Ports (see 2.3)	according to DIN 3852
Installation position	any position
Hydr. pressure fluid	mineral oil, acc. DIN 51524 and DIN 51525 (HL/HLP)
Ambient temperature	-30 ... 60°C
Recommended pressure fluid temperature range	20 ... 60°C
min.	-20°C
max.	80°C
Recommended viscosity range	15 ... 100 mm <sup>2</sup> /s
min.	10 mm <sup>2</sup> /s
max.	380 mm <sup>2</sup> /s
Filtration / purity class	ISO 4406 class 18/15 NAS 1638 class 9

### 2.2 Hydraulic characteristic data

	unit	value
max. pump flow	l/min.	550
max. actuator flow	l/min.	330
max. pump pressure	bar	350
max. load pressure	bar	420
max. tank pressure	bar	50
max. tank pressure for electr. pilot control	bar	5
Nominal supply pressure for electr. pilot control	bar	30
max. pilot pressure	bar	50

### 2.3 Port sizes

	port	size
Actuator	A / B	G 1 ¼
Pump	P	G 1 ¼
Tank	T	G 1 ½
Load signal	XL	G ¼
Pump for pilot control	X	G ¼
Tank for pilot control	Y	G ¼
Measurement point for pump pressure	MP	G ¾
Measurement point for tank pressure	MT	(G ¼)
Measurement point for pilot control pressure	MX	G ¼

### 2.4 Characteristic data for proportional electrical actuation

	unit	value
Control current, opening point	mA	300
Control current, max. stroke	mA	650
Hysteresis with PWM signal 100 Hz (control current at max. stroke)	%	±3
Control characteristic (see diagramm 3.2)		
Protection class according to DIN VDE 0470		IP65
Isolation class acc. to VDE 0580		H
Nominal voltage	V	24
Coil resistance at 20°C	Ω	21.2 ± 5%
Coil resistance at 60°C	Ω	24.5 ± 5%
Power consumption at max. spool stroke (coil resistance at 60°C)	VA	10.4
max. current at cyclic duration factor of 100%	mA	750

electrical connection: AMP Junior Power Timer

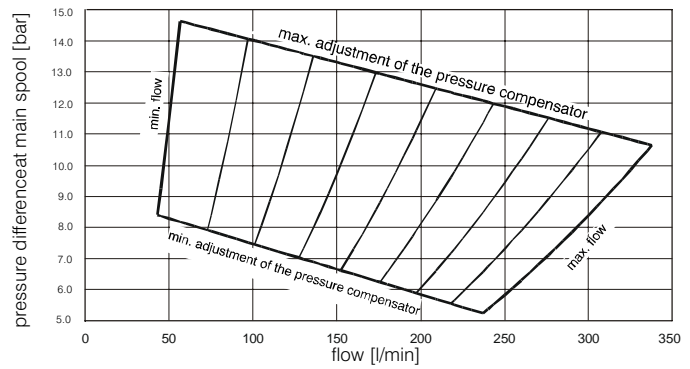
### 2.5 Characteristic data for hydraulic actuation

	unit	value
control pressure range	bar	5 ... 19
control characteristic (see diagram 3.2)		
max. pilot pressure	bar	50

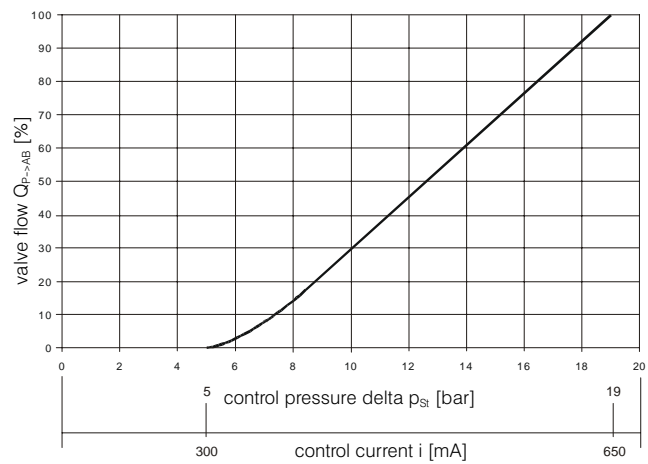
### 3. Diagrams

#### 3.1 Flow characteristic P-A/B

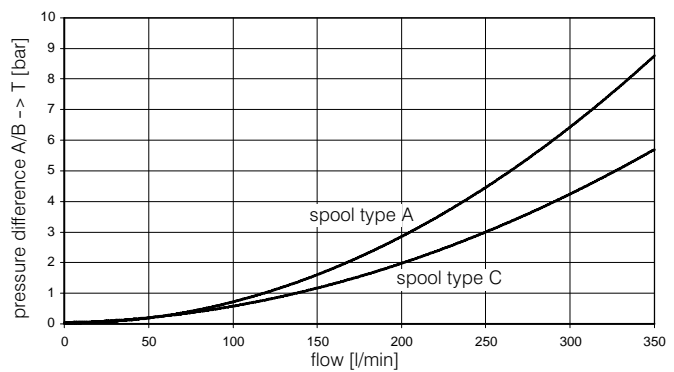
The cross section geometry of the spool and adjustment of pressure difference will be defined by the manufacturer—so the working range of the valve is within the characteristic diagram.



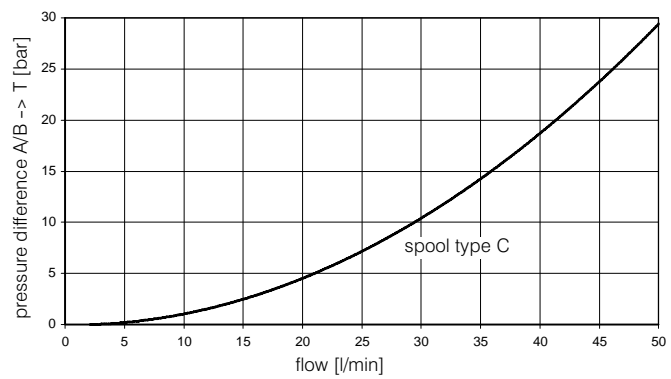
#### 3.2 Control characteristic



#### 3.3 Pressure difference at main spool at 100% stroke

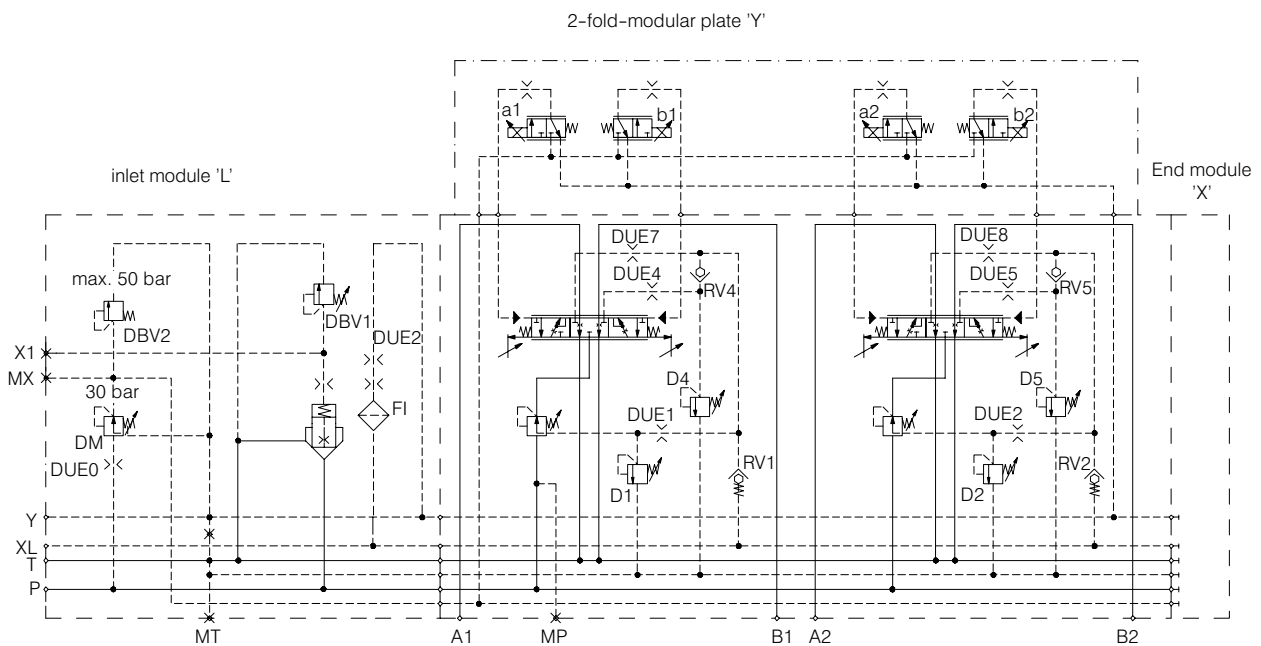



### 3.4 Pressure difference at main spool in neutral position



### 4. Circuit diagram

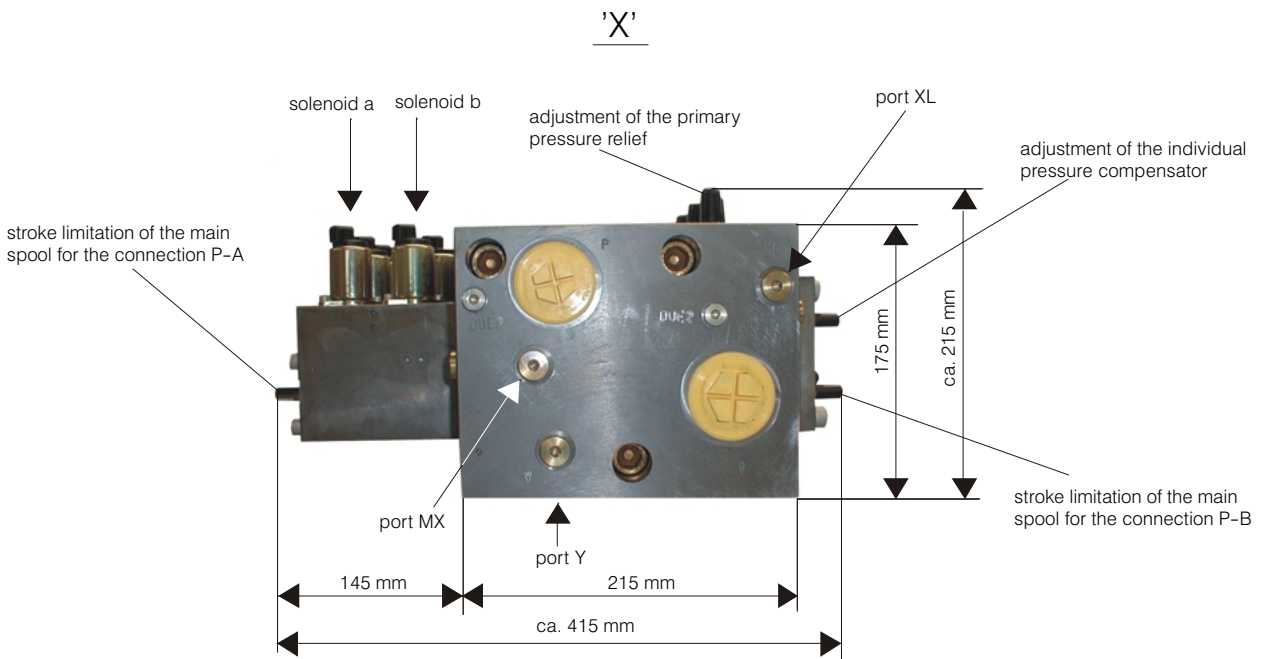
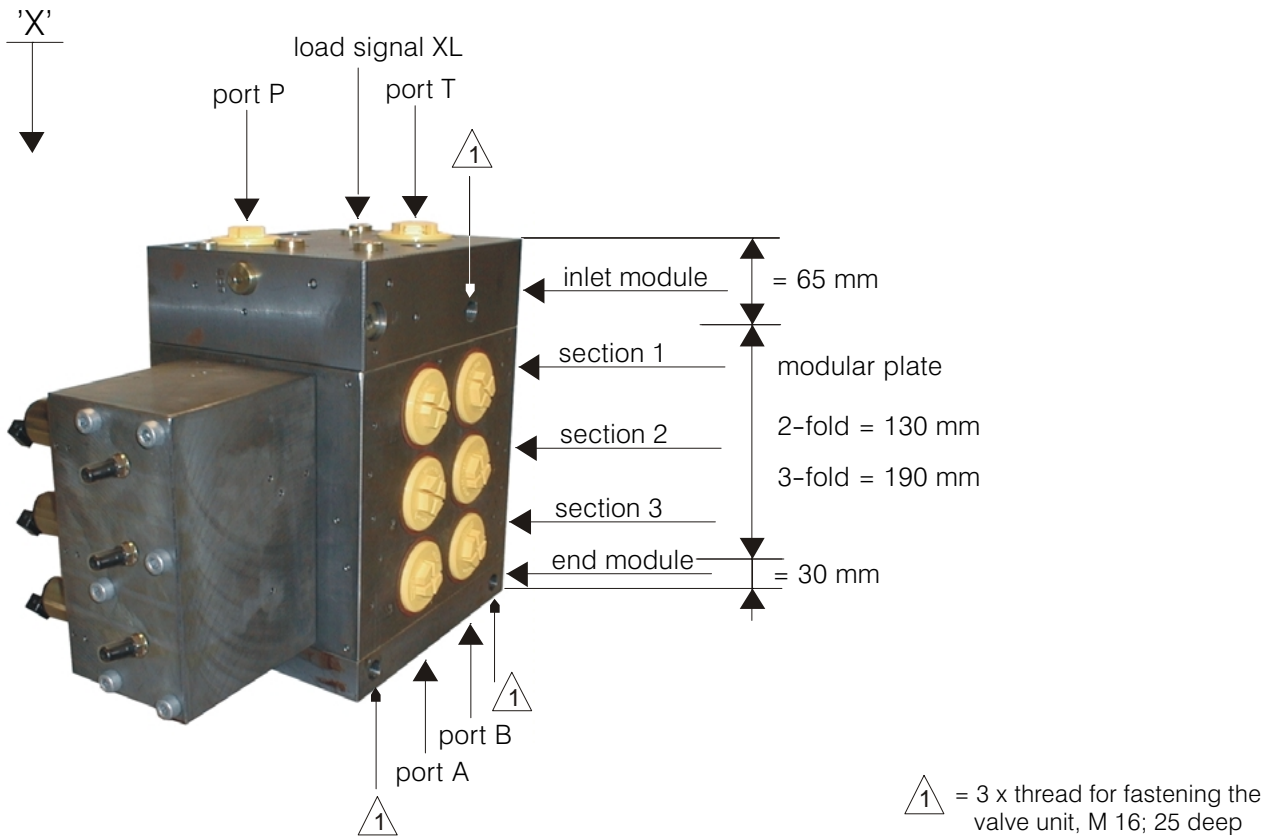
Example of a valve with inlet module, two actuator sections with primary pressure relief for 'A' and 'B', electrical piloted and end module.



 Note: If solenoid 'a' is controlled the valve opens from 'P' to 'B'.

## 5. Measurements

Example of a LV22 (inlet module 'F', 3-fold modular plate 'Y' electrical piloted, end module 'X')





## 6.2 Legend of the type code

### 6.2.1 Valve series

LV: proportional valve in sandwich design

### 6.2.2 Size

Size 22 allows a flow of the actuator up to 330 l/min..

### 6.2.3 Numbering of the sections on-module

Inlet and end module each consist of one section. The end module has no actuator ports 'A' and 'B' in standard.

The actuator module consists of two respectively three sections with actuator ports 'A' and 'B'. By combining these

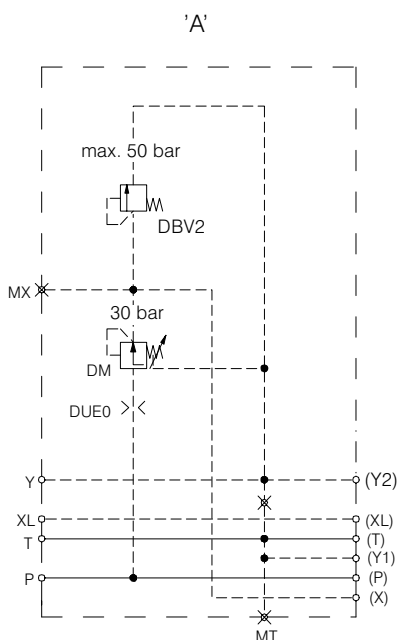
modular plates a valve bank up to max. 8 sections is possible.

Possibilities of valve banks:

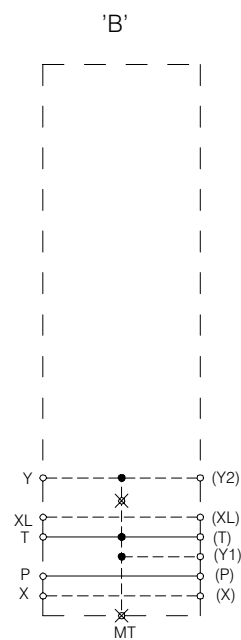
2 actuators	=	inlet module	+	1 two-fold modular plate	+	end module
3 actuators	=	inlet module	+	1 three-fold modular plate	+	end module
4 actuators	=	inlet module	+	2 two-fold modular plates	+	end module
5 actuators	=	inlet module	+	1 two- and 1 three-fold modular plate	+	end module
6 actuators	=	inlet module	+	2 three-fold modular plates	+	end module
7 actuators	=	inlet module	+	2 two- and 1 three-fold modular plate	+	end module
8 actuators	=	inlet module	+	2 three- and 1 two-fold modular plate	+	end module

### 6.2.4 Modules

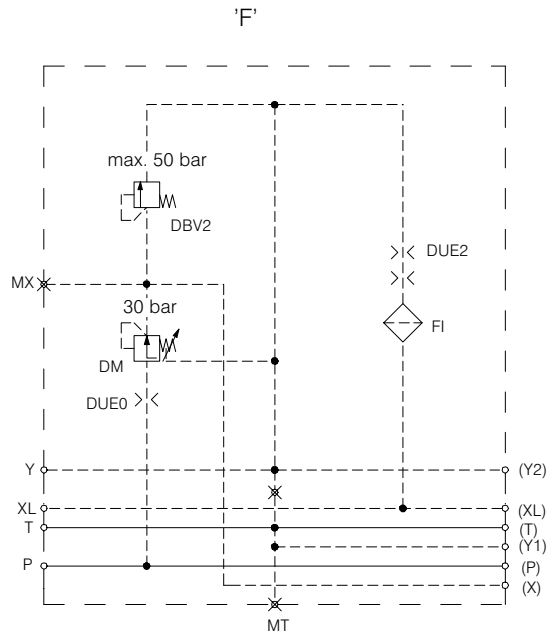
#### 6.2.4.1 Inlet module



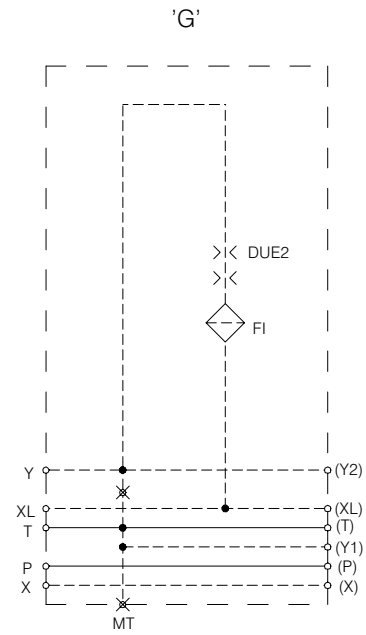
Internal pilot control valve supply (with pressure reduction)  
Pump connection module without function



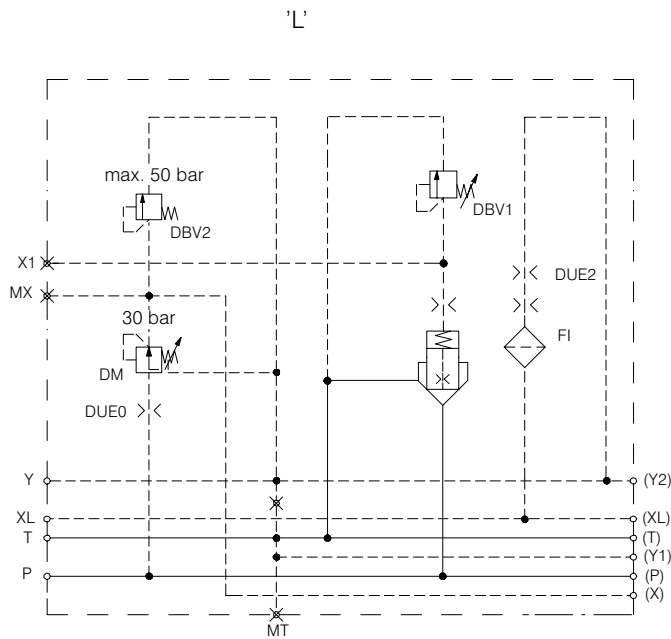
External pilot control valve supply (without pressure reduction)  
Pump connection module without function



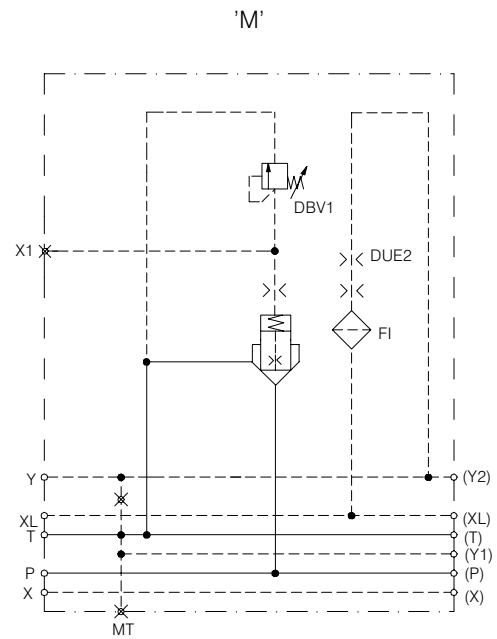
**Internal pilot control valve supply (with pressure reduction)**  
Pump connection module with release of the load-sensing signal



**External pilot control valve supply (without pressure reduction)**  
Pump connection module with release of the load-sensing signal

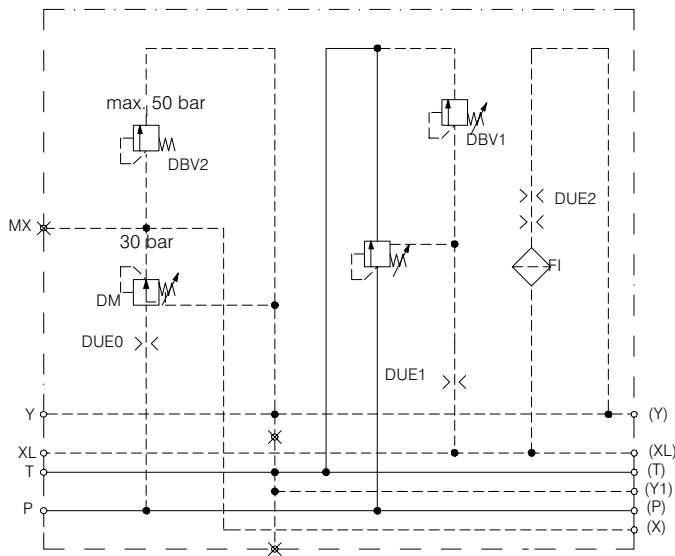


**Internal pilot control valve supply (with pressure reduction)**  
Pump connection module with primary pressure relief valve for protection of the hydraulic pump against overpressure and release of the load-sensing signal



**External pilot control valve supply (without pressure reduction)**  
Pump connection module with primary pressure relief valve for protection of the hydraulic pump against overpressure and release of the load-sensing signal

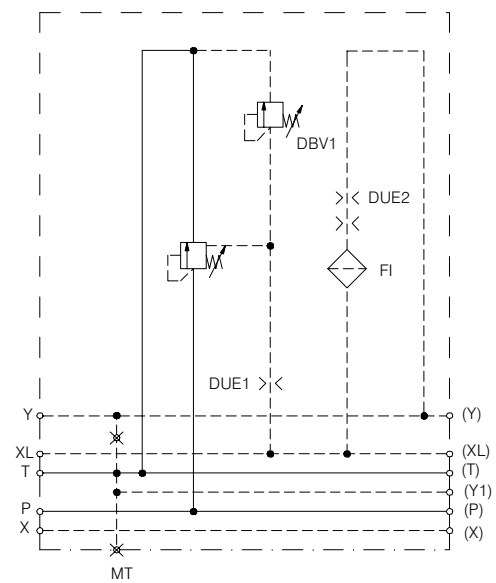
'U'



**Internal pilot control valve supply (with pressure reduction)**

Pump connection module with 3-way pressure compensator and primary pressure relief valve for protection of the hydraulic pump against overpressure and release of the load-sensing signal

'V'



**External pilot control valve supply (without pressure reduction)**

Pump connection module with 3-way pressure compensator and primary pressure relief valve for protection of the hydraulic pump against overpressure and release of the load-sensing signal

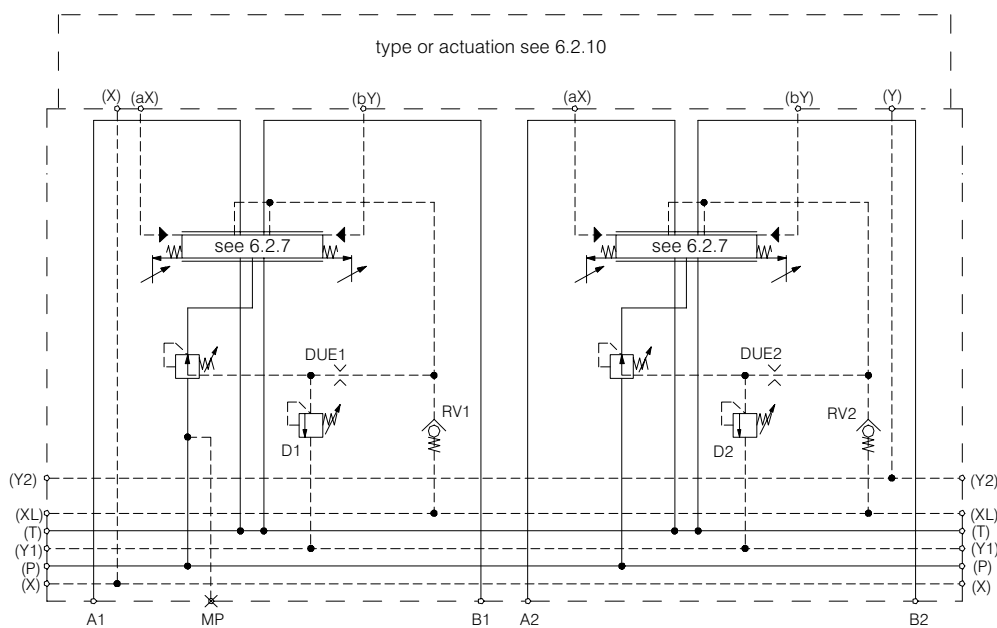
These inlet modules - presented above - are types with external release of the pilot control circle to the tank. They also are available with the option internal re-

lease (internal connection of 'Y' with 'T') - which has to be indicated with the type code (see page 8 - 'additional in-

dications'). With internal tank release and electrical actuation the tank pressure (p) may not exceed 5 bar.

6.2.4.2 Modular plate without actuation

'Y'



These modular plates are available as 2-fold (as presented above) and as 3-fold modules.

### 6.2.4.3 End module

The end module is an ordinary end plate without valve functions. Modifications are available on request.

### 6.2.5 Pressure adjustment

Inlet modules: 'L', 'M', 'U' and 'V' -> primary pressure relief

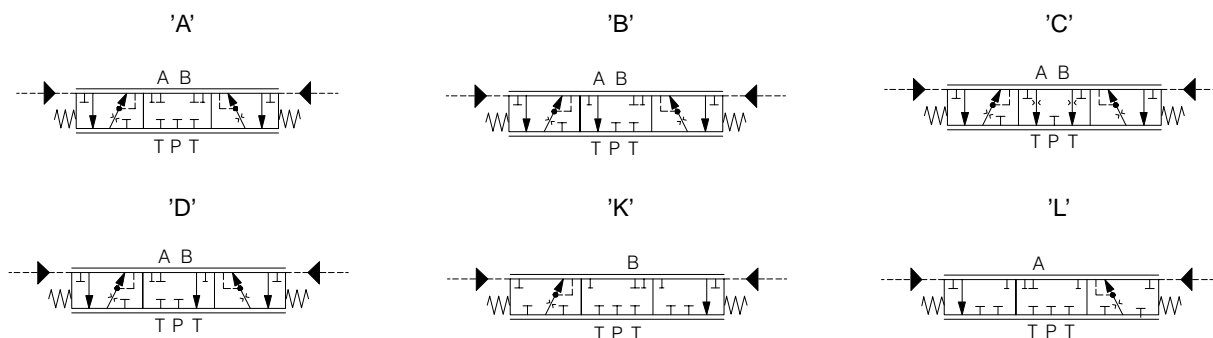
Each actuator section will be adjusted to the required maximum pressure.

### 6.2.6 Pressure adjustment

With an additionally pressure relief valve the actuator 'B' can be protected (see diagram para 4.).

If using two pressure relief valves for protection of actuators 'A' and 'B' – the pressure adjustment for 'B' must be lower than the pressure adjustment for 'A'.

### 6.2.7 Spool symbols



### 6.2.8 Indication of the flow rate for actuator side 'A'

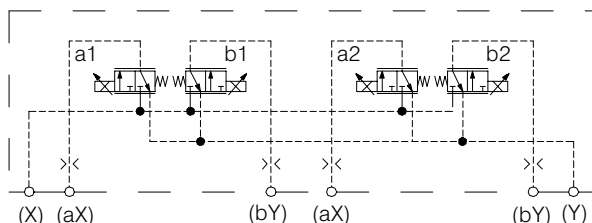
Flow rates available up to 330 l/min

### 6.2.9 Indication of the flow rate for actuator side 'B'

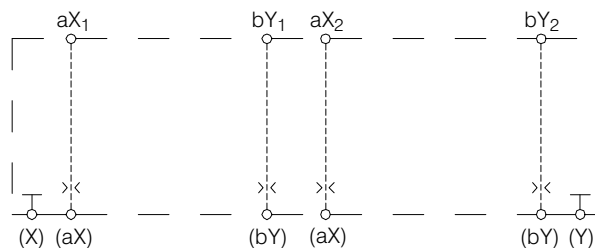
Flow rates available up to 330 l/min

## 6.2.10 Types of actuation (presentation 2-fold)

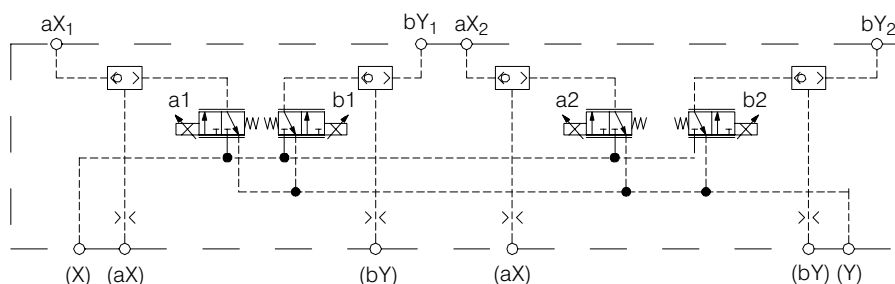
'E20' electrical piloted



'Y00' hydraulic



'Y20' combination of E20 / Y00



The solenoids of the pilot valve have a mechanical actuation for service.

For the electrical control of the valve it is recommended to use a current regulator card with a restriction of the current to 750 mA (see electrical characteristics para 2.4)

These electrical control cards you find in our catalogue; see ER81, ER812 and PROCON.

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