

V5 60 LPM SECTIONAL SPOOL VALVE



V5 60 LPM SECTIONAL SPOOL VALVE

Description

A low profile sectional spool valve, lever, solenoid or cable operated. Suitable for open or closed centre circuits. Spool options for 2, 3 & 4 position valves, all with excellent metering characteristics and with fine metering spools also available. Direct acting or pilot operated main relief valves can be incorporated into the inlet cover. Extensive range of lever options, inter-sections, solenoid sections and ancillaries are available.

On the solenoid sections the powerful internal oil pilot is switched by solenoid operated cartridges using a compact 24-watt DC coil. A damping orifice fitted in the pilot line eliminates the harshness associated with standard direct acting solenoid valves, giving a positive feel to the control system. The V5-60E solenoid valves can be built in to a valve assembly containing manual valves and any of the extensive range of V5-60 ancillary valves.

Application

Designed to be used in many applications requiring a compact, rugged sectional spool valve, and suitable for use in the industrial, mobile, marine and agricultural markets. Using the comprehensive range of options, a valve bank can be assembled to control a variety of hydraulic circuits.

Features

- Excellent metering characteristics.
- Excellent load holding.
- Integral load check valve.
- Open and closed centre assemblies.
- Direct acting or piloted adjustable relief valves.
- Robust enclosed lever mechanism.
- Extensive range of ancillaries and intersections.
- Open and closed centre options.
- 100% production testing.

As well as the above the solenoid valves further feature

- 12 and 24V DC & 110 VAC solenoid
- Soft spool action.
- Manual and solenoid sections placed together in the same bank.
- Lever override option.
- Low coil power drain.

V5 TECHNICAL INFORMATION

Technical Data

Performance

Rated Flow	60 l/min
Max pressure, inlet port	250 bar
Max pressure, inlet port	210 bar*
Max pressure, service port	250 bar
Max back pressure, outlet port	25 bar
Min pilot pressure	12.5 bar
Temp rating: minimum	-20°C
Temp rating: maximum	+65°C
Spool leakage at 210 bar at 20°C	<6cc/min
Spool leakage 4 position	<8cc/min

*applies to assemblies containing solenoid sections

Electrical

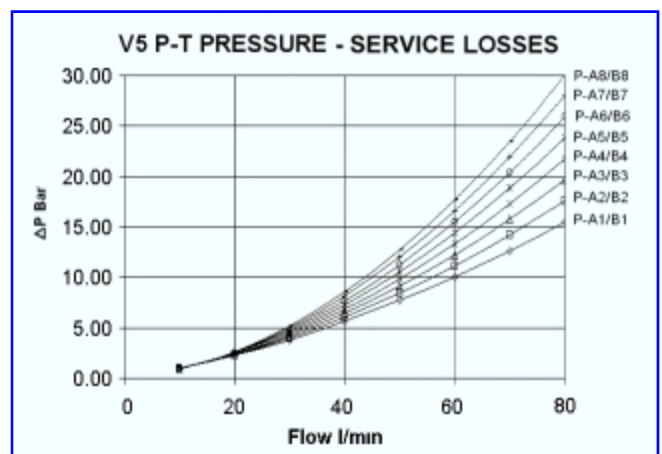
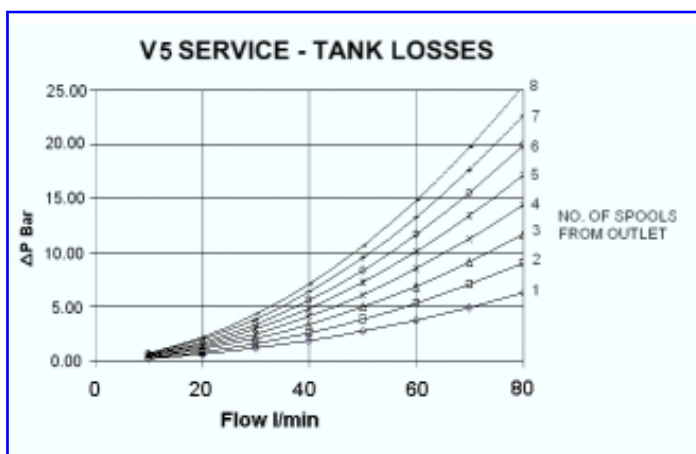
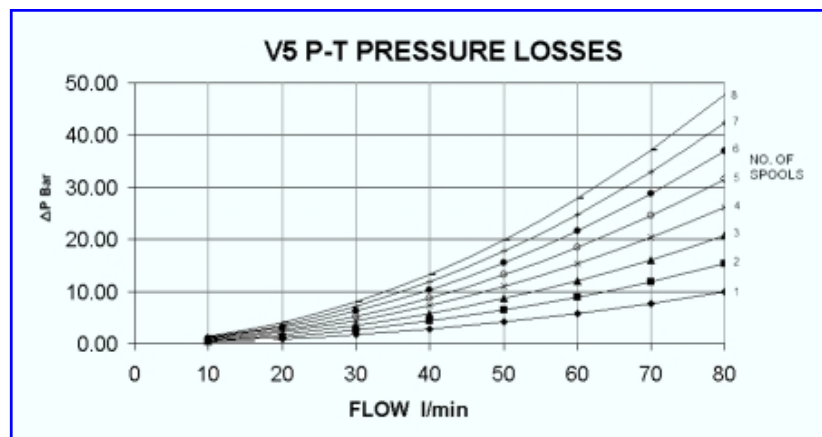
Coil voltage nominal	12/24VDC or 110vac 50 Hz
Coil power	24W
Connection	DIN 43650
Protection	IP67
Cable Ø (not supplied)	6 - 8mm

Materials

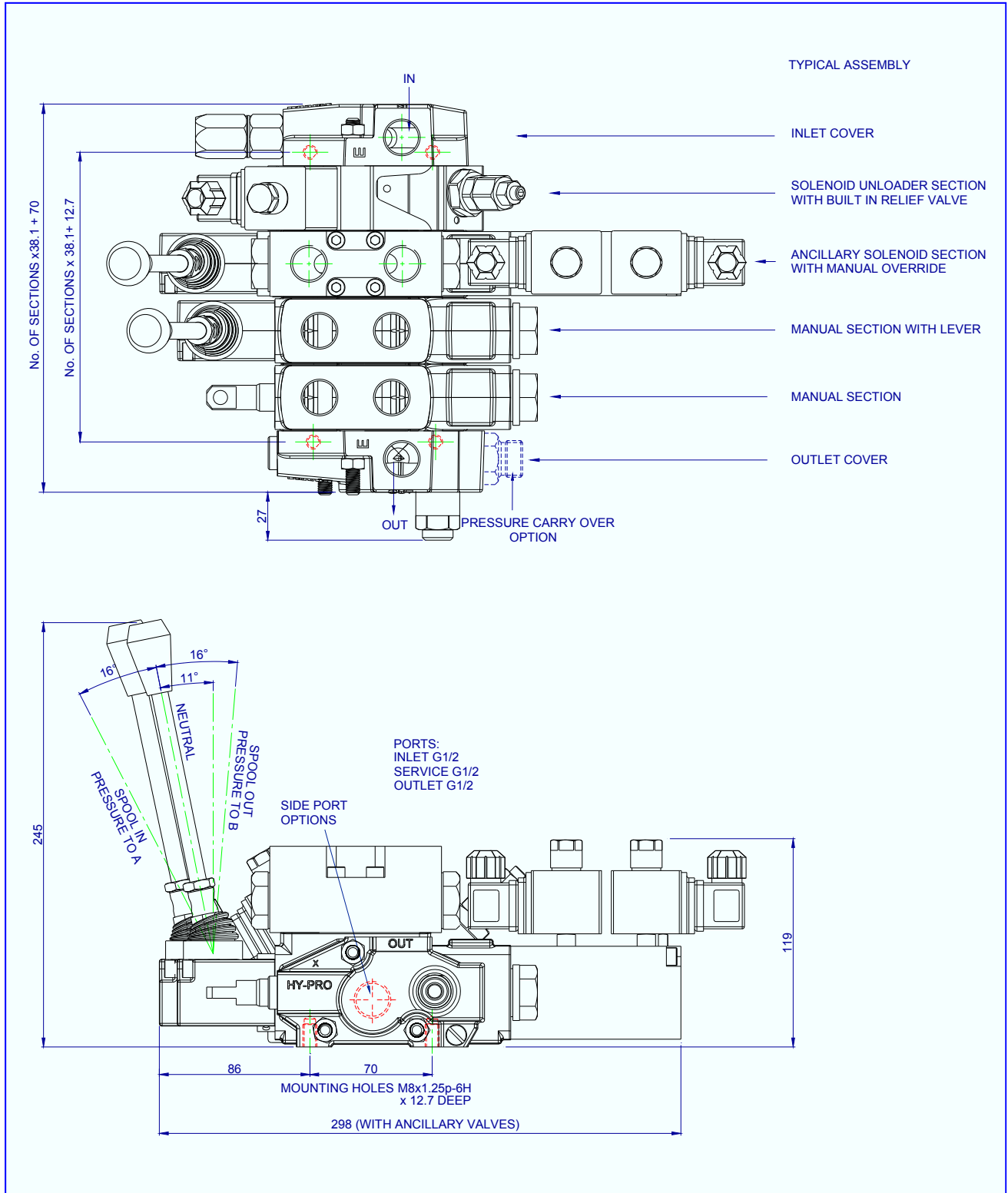
Body - cast iron	BS1452-250
Tie studs M8	M/F45T
Tie studs torque	13.5 Nm
Seals	Nitrile

Recommended Oil

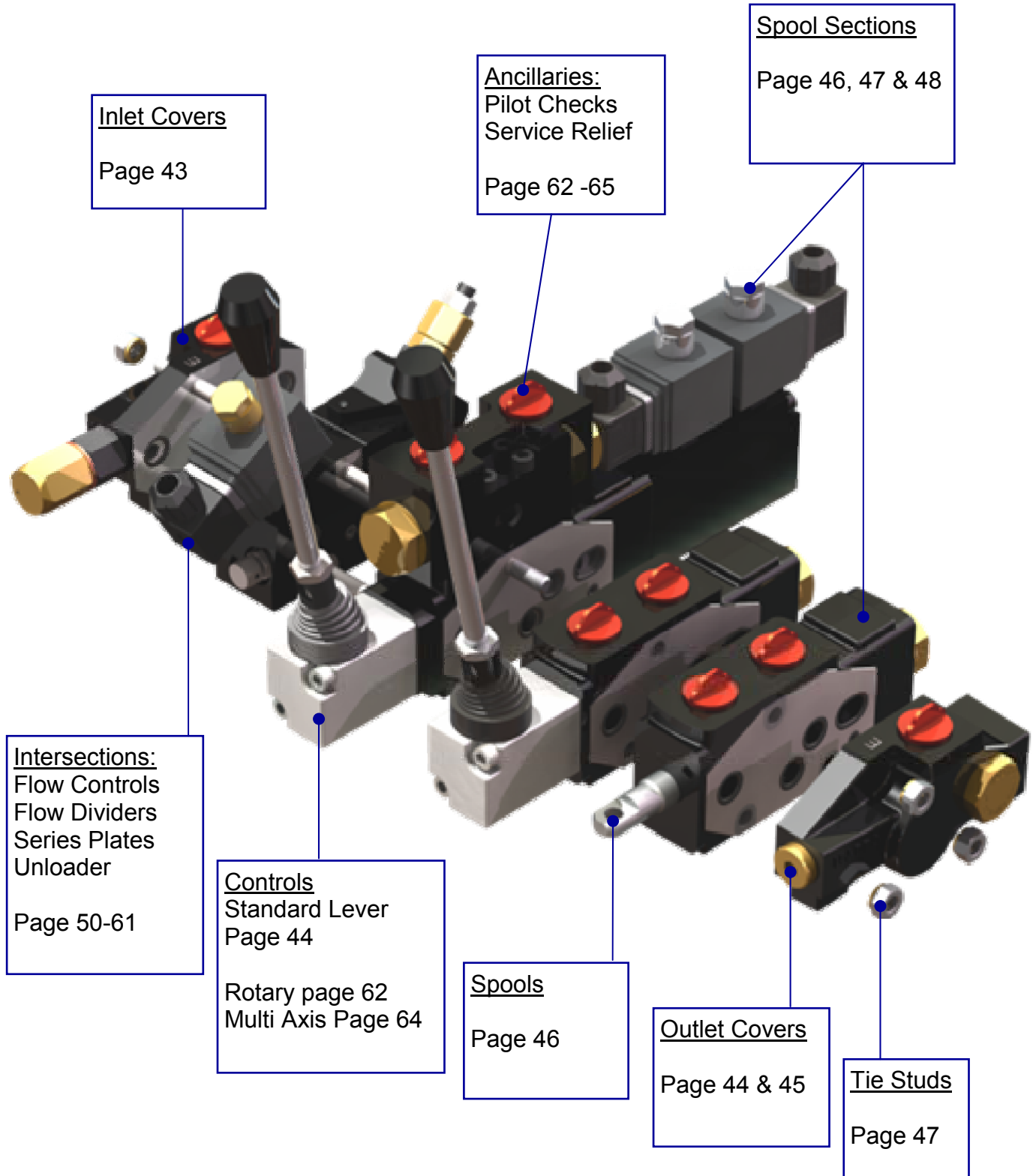
Mineral based hydraulic	ISO VG37
Filtration (minimum)	25 micron



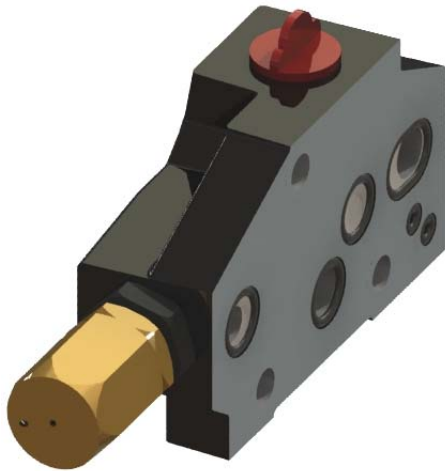
V5 INSTALLATION DETAILS



V5 SECTIONAL VALVE ANATOMY



V5 INLET COVER - MANUAL ONLY VALVES



SPECIFICATION

Material

Cast Iron BS1452-250

Relief Valve

Adjustable. Pilot Operated or Direct Acting. Pre-set 140bar unless stated

Ports

Top or Side entry
G1/2 standard size
Metric And SAE options available

Options

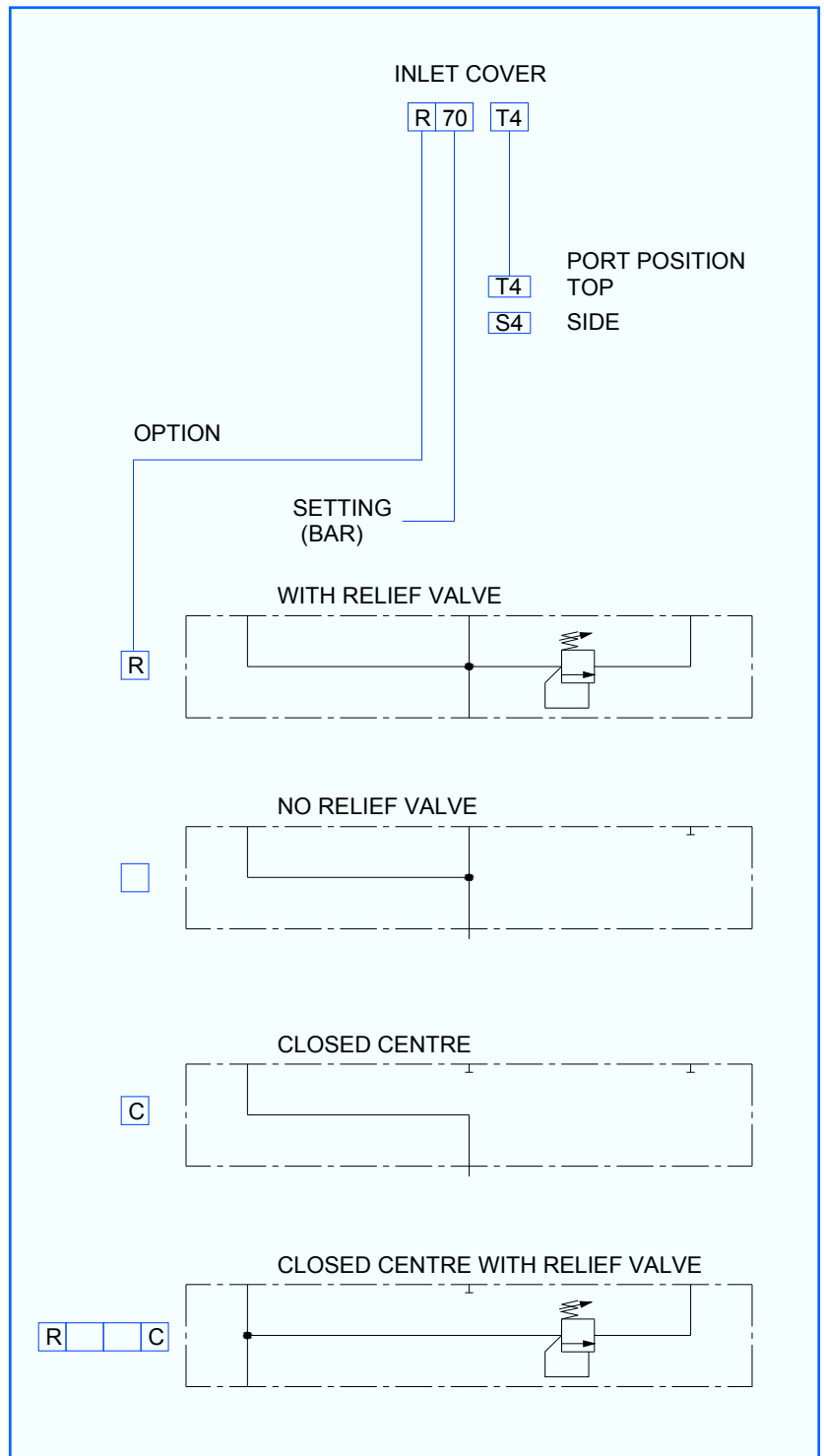
With Relief Valve (standard)
No Relief Valve
Closed Centre

Mounting

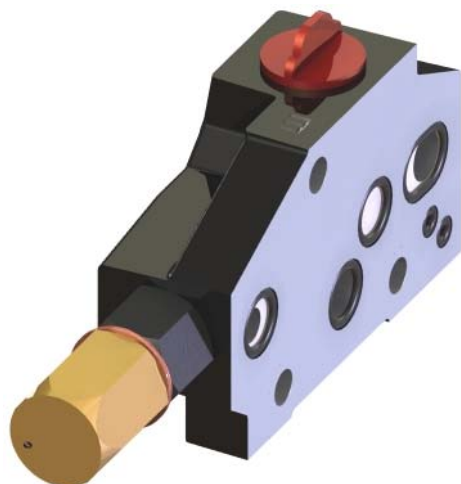
2x M8x1.5p-6H x 12.7

Weight

0.75kg



V5 INLET COVER - VALVES WITH SOLENOID CONTROL



The V5E solenoid inlet cover contains connections for the solenoid oil-pilot valves and features a special pressure-line filter. It must be used in conjunction with a solenoid outlet cover (page 9).

Can also be used with manual valves and sections.

SPECIFICATION

Material

Cast Iron BS1452-250

Relief Valve

Adjustable. Pilot Operated or Direct Acting. Pre-set 140bar unless stated

Ports

Top or Side entry
G1/2 standard size
Metric And SAE options available

Pressurising Valve

17 Bar back pressure min.

Options

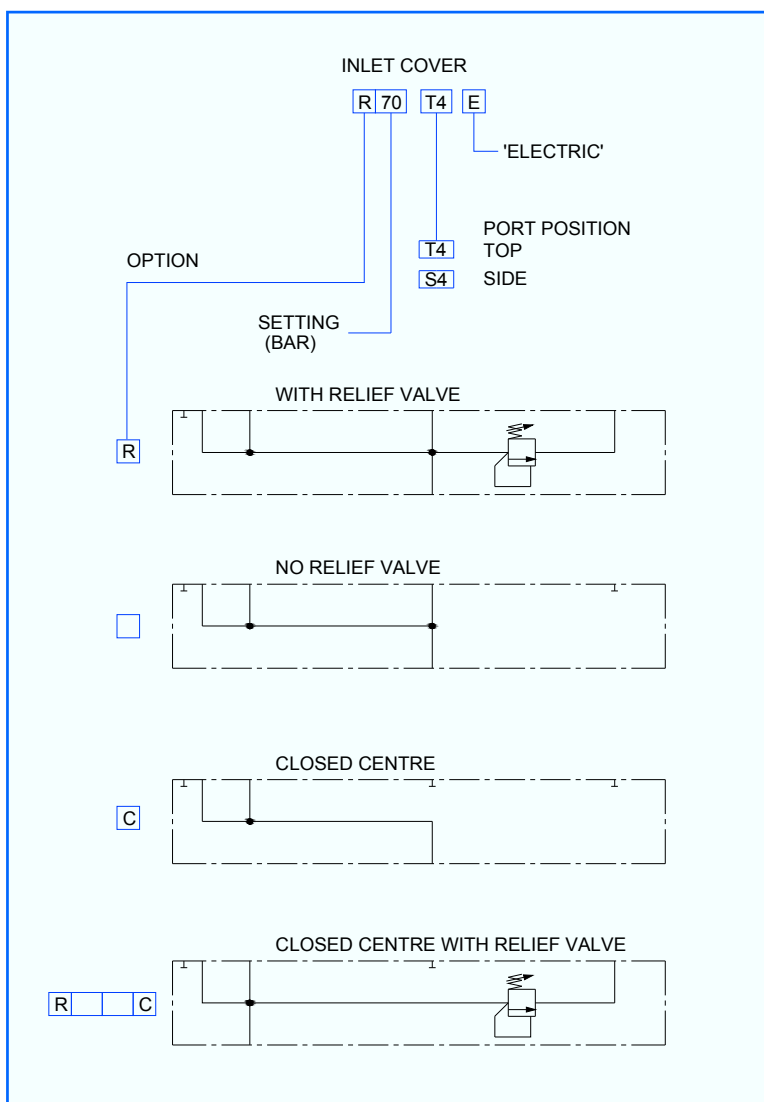
With Relief Valve (standard)
No Relief Valve
Closed Centre

Mounting

2x M8x1.5p-6H x 12.7

Weight

0.75kg



COMBINED INLET AND UNLOADER

A combined inlet and unload cover with relief valve. It also includes the pilot valve and internal connections for solenoid operated valve sections. It can be used with a standard outlet cover - ref. p 46.



SPECIFICATION

Material

Aluminium BS 1490

Relief Valve

Adjustable. Pilot Operated
Pre-set 140bar unless stated

Manual Override

Screw in to operate

Unloader

NC Normally closed
Unloads P to T unless energised

Ports

Top entry
G1/2 standard size
Metric And SAE options available

Options

No Relief Valve

Mounting

2x M8x1.5p-6H x 12.7

COMBINED INLET & UNLOADER

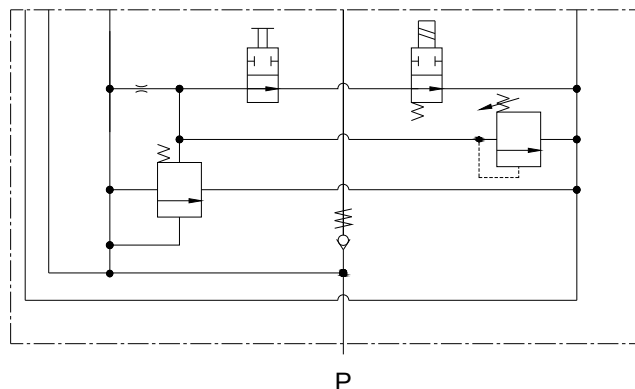
RXXXT4E U 12

XXX = RELIEF
VALVE SETTING
140B UNLESS STATED

UNLOADER
SOLENOID VOLTAGE

12 12VDC

24 24VDC



SPECIAL UNLOADING INLET



This special unloading inlet cover maintains 60lpm to the valve regardless of the inlet flow up to a maximum of 100lpm. Excess flow is returned to tank via the outlet port.

SPECIFICATION

Material

Aluminium BS 1490

Relief Valve

Adjustable. Pilot Operated
Pre-set 140bar unless stated

Input flow

100lpm Max

Max flow to valve

60lpm

Ports

Side entry
G3/4 standard size
Metric And SAE options
available

Mounting

2x M8x1.5p-6H

Weight

2.0kg

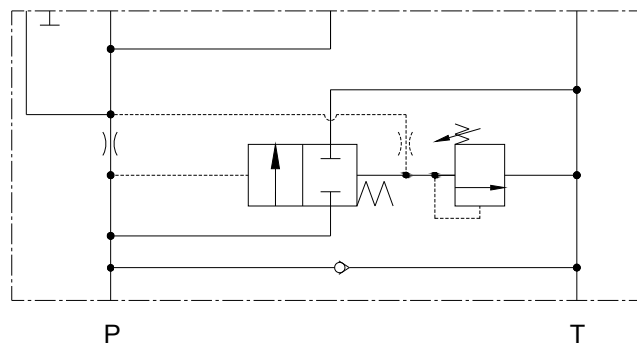
UNLOADING INLET

R XXX S6 S6O FCS 60 CV

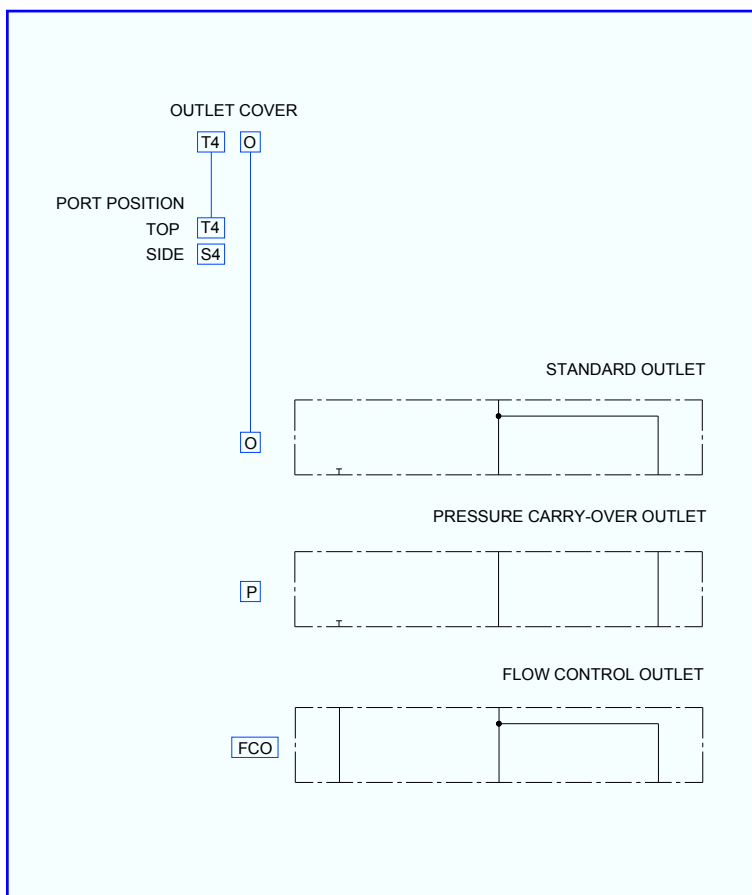
XXX = RELIEF
VALVE SETTING
140B UNLESS STATED

SET FLOW

XX Lpm



V5 OUTLET COVERS - MANUAL ONLY VALVES



SPECIFICATION

Material

Cast Iron BS1452-250

Ports

Top or Side entry
G1/2 standard size
Metric And SAE options available

Mounting

2x M8x1.5p-6H x 12.7

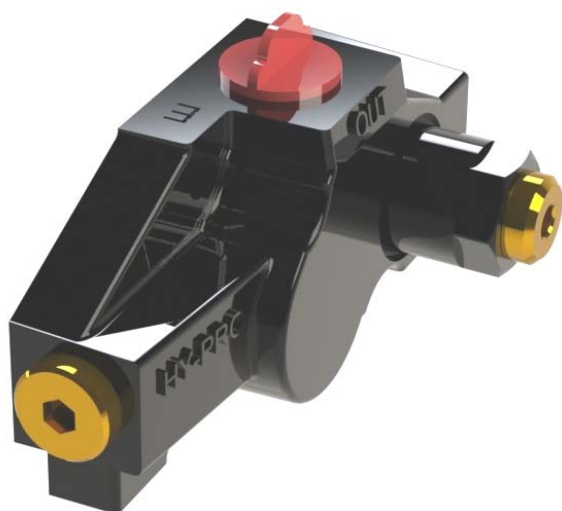
Weight

0.8kg

Options

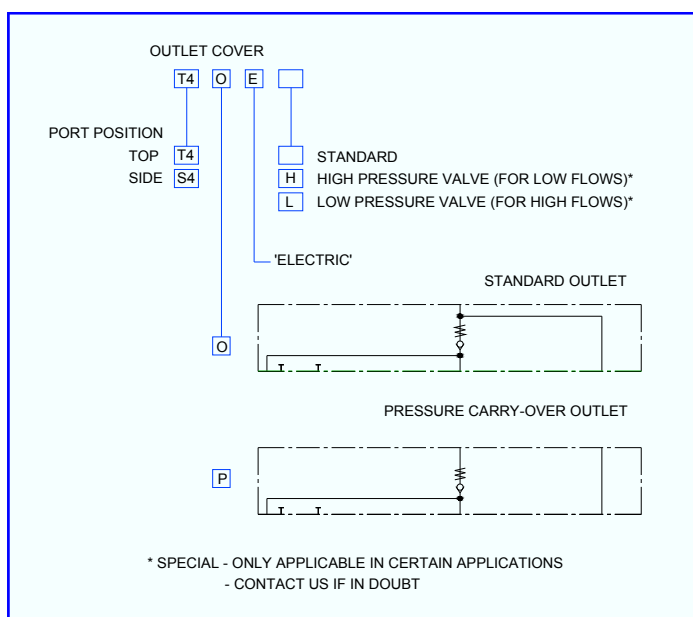
Standard Outlet (Tank port)
Pressure Carry-Over
(Tank port plus a Pressure port to feed further valves in the circuit)
Flow Control Type
(used to convert sectional FC to Line-mounted operation)

V5 OUTLET COVERS - VALVES WITH SOLENOID CONTROL



The V5E solenoid valve outlet cover contains a small restrictor valve which maintains a pressure for the solenoid oil-pilot valves. The restrictor valve is available with special options for certain low and high flow applications - contact us for details.

This outlet must be used in conjunction with a solenoid valve inlet cover (page 6) and is not suitable for use in assemblies with only manual sections.



SPECIFICATION

Material

Cast Iron BS1452-250

Ports

Top or Side entry
G1/2 standard size
Metric And SAE options available

Mounting

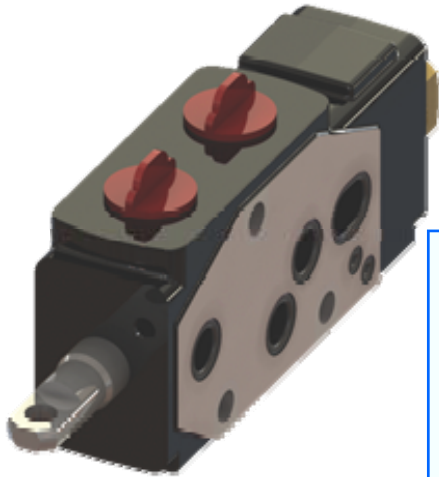
2x M8x1.5p-6H x 12.7

Weight

0.8kg

Options

Standard Outlet (Tank port)
Pressure Carry-Over
(Tank port plus a Pressure port to feed further valves in the circuit)



V5 MANUAL VALVE SECTION

SPECIFICATION

Body Material
Cast Iron BS1452-250

Spool
Mild steel. Case
hardened and ground

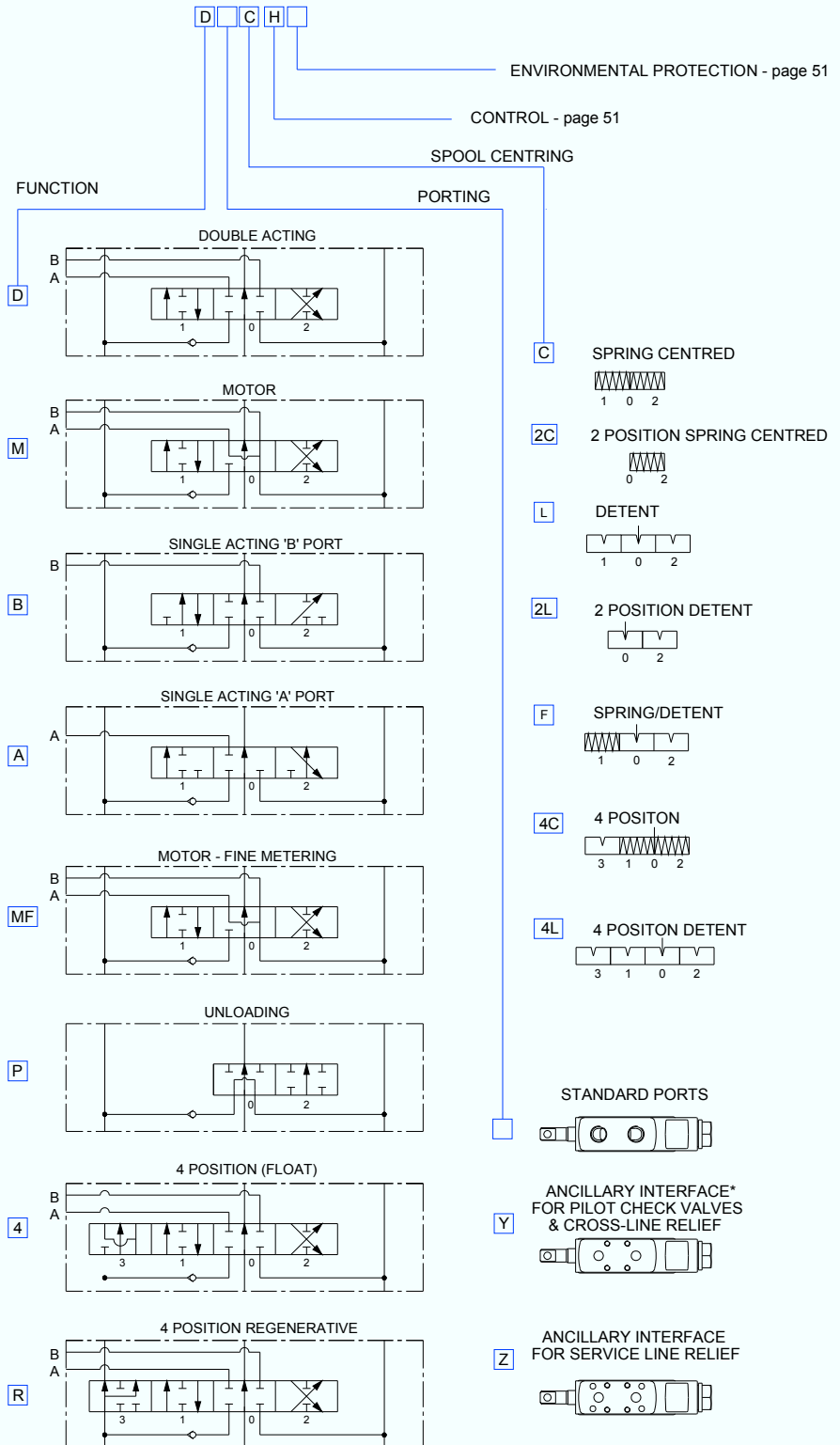
**Environmental
protection option**
Electroless nickel plated
spool

Tie Studs
BS970 pt1 1991 605M36
(EN16T)
Torque 13.5Nm

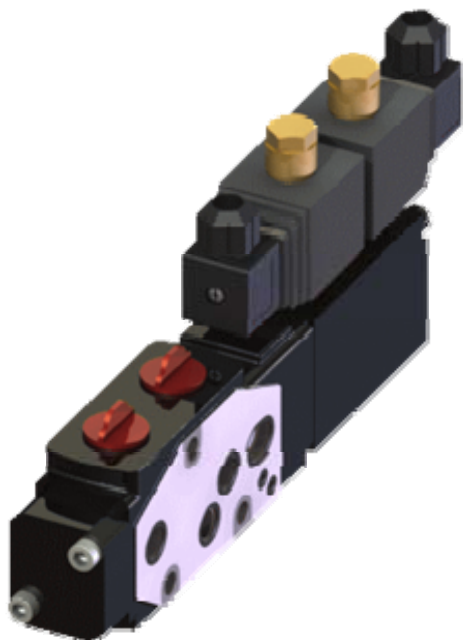
Ports
G1/2 standard size
Metric And SAE
available options.

Ancillary Interface
When ancillary valves
are required the port face
is denoted Z

Weight
2.0kg



V5 SOLENOID VALVE SECTION



SPECIFICATION

Body Material

Cast Iron BS1452-250

Spool

Mild steel. Case hardened and ground

Tie Studs

BS970 pt1 1991 605M36 (EN16T)
Torque 13.5Nm

Ports

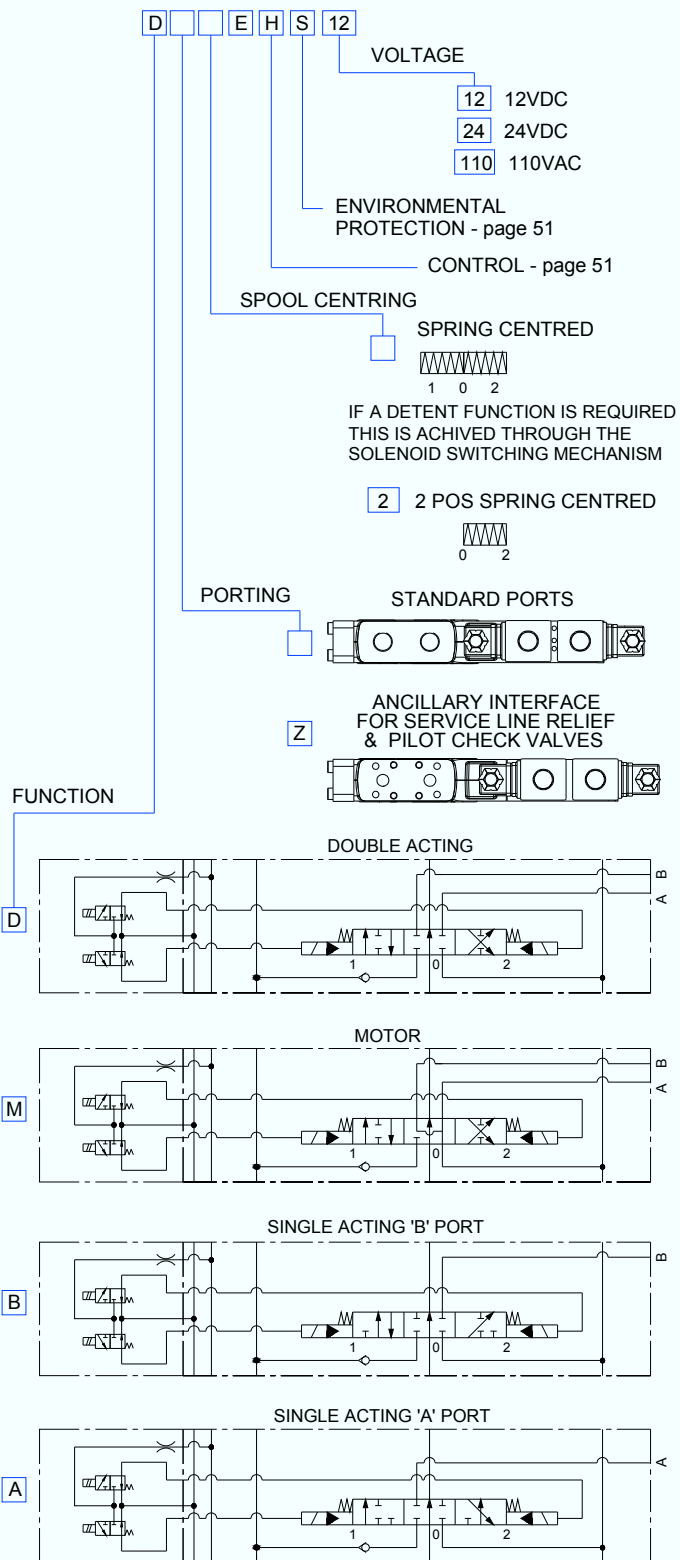
G1/2 standard size
Metric And SAE
available options.

Ancillary Interface

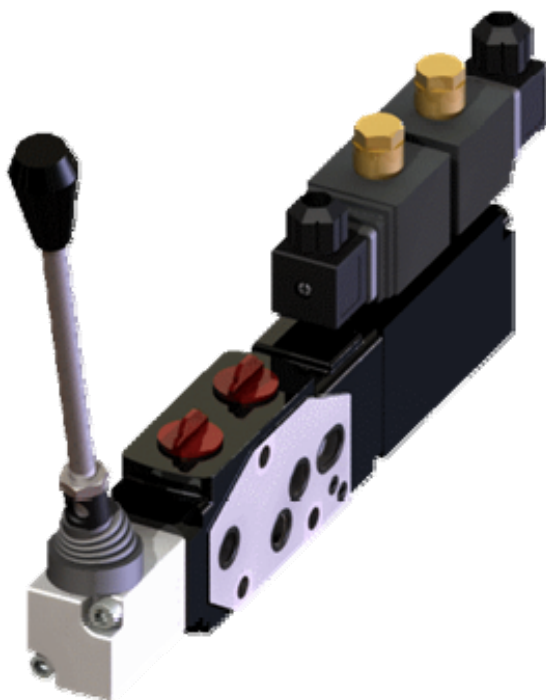
When ancillary valves are required the port face is denoted Z

Weight

2.5kg



V5 SOLENOID VALVE LEVER OVERRIDE



SPECIFICATION

Materials

Housing: Aluminium LM24TF
 Actuator: Steel Nitro-carburised
 Pivot: Steel Hardened
 Fasteners: British Grade 6.6

Fixing

2x M6 Cap screw (Torque - 10lbs/ft)

Knob

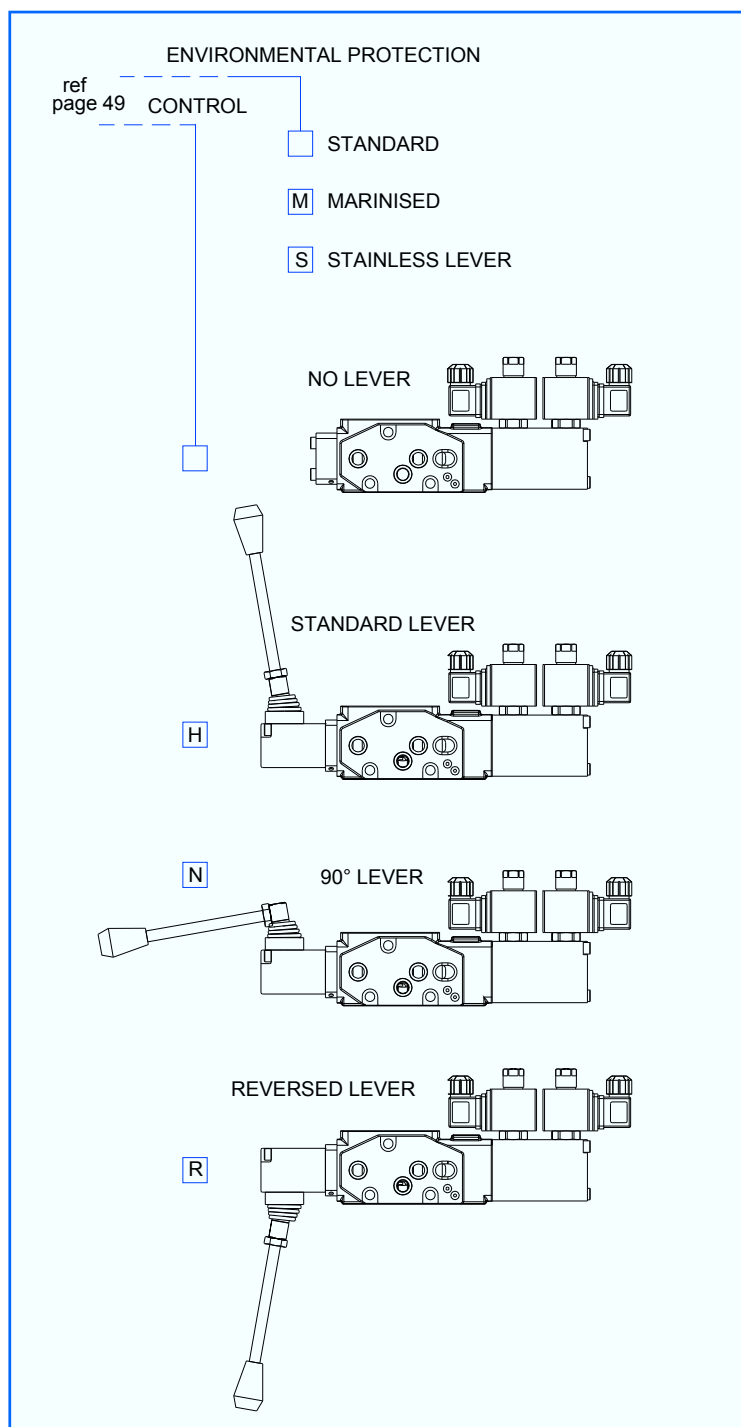
Black standard, Red, Blue, Green, Red, Yellow and Ident' type available

Environmental protection option

Housing: Anodised
 Lever: Stainless steel 304

Weight

0.3kg





V5 STANDARD LEVER

SPECIFICATION

Materials

Housing: Aluminium LM24TF
 Actuator: Steel Nitro-carburised
 Pivot: Steel Hardened
 Fasteners: Deltatone

Fixing

2x M6 Cap screw (Torque - 10lbs/ft)

Knob

Black standard, Red, Blue, Green,
 Red, Yellow and Ident' type available

Options

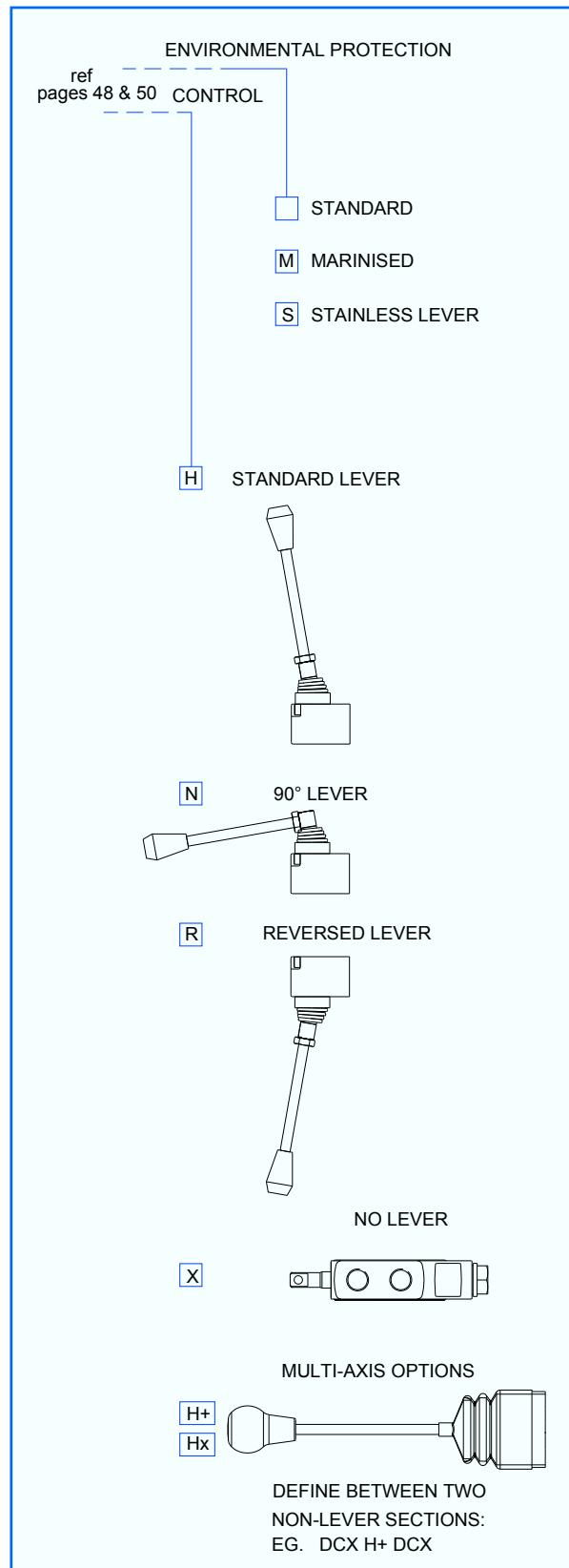
Standard or Multi-axis
 Aux cable attachment

Environmental protection option

Housing: Anodised
 Lever: Stainless steel 304

Weight

0.3kg



V5 INTERSECTIONS

FLOW CONTROL

A fully pressure compensated metering type flow control, which can be included in a V5 valve assembly. The regulated flow is supplied via the pressure gallery to 'down stream' sections, while 'up stream' are unaffected. A variety of controls are available to allow the flow to be pre-set or continually adjustable. A relief valve option limits the maximum pressure within the pressure gallery and a series link can be supplied to ensure full pump flow is available to the regulated sections even when up-stream sections are in use.

Description

A meter-in type flow control intersection, which regulates flow to 'down stream' sections only. Pressure compensated, it returns the excess flow to the tank gallery. This ensures consistent control and minimum heat generation. A relief valve option limits the maximum pressure in the pressure gallery, a series link will maintain pump flow to the flow controls even when up stream sections are in use.

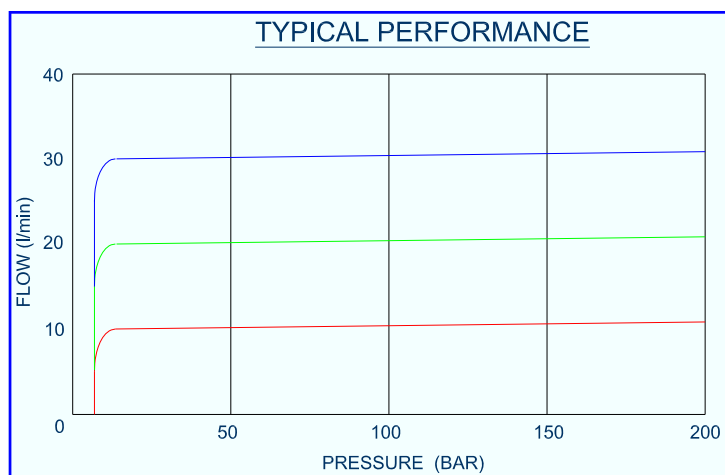


Application

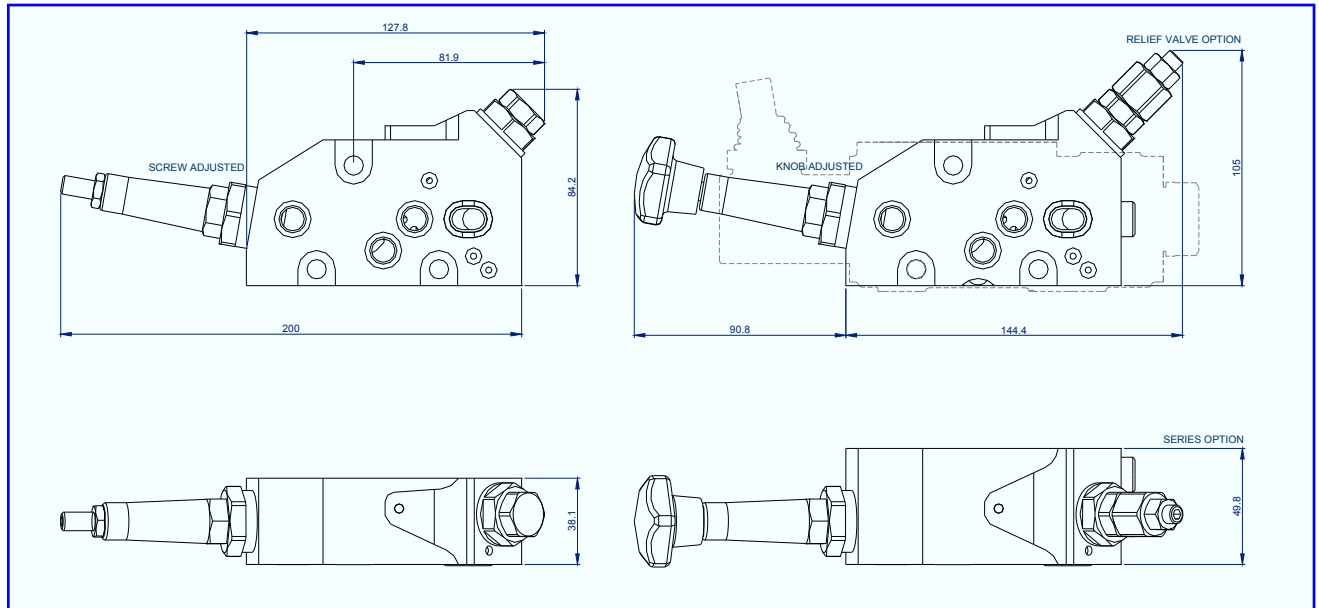
To be used in applications requiring precise speed control in addition to stop, start and reverse functions of the spool valve, such as winches and industrial conveyors. Can also be used to control the speed of cylinders.

Features

- Pressure compensated.
- Adjustable or pre-set.
- Screw, knob or cable operated.
- Solenoid two speed option.
- Range of metering characteristics.
- 1 turn option.
- Limited max flow option.
- Fixed flow option
- Adjustable relief valve option.
- Series link option.
- Hardened and ground components for long life.



V5 INTERSECTIONS



Flow Control Specification

Performance

Rated flow	60 l/min
Adjustable range	0-60 l/min
ΔP Inlet to outlet 40 l/min	0.9 bar
ΔP Inlet to service 40 l/min	6.9 bar
Maximum pressure	250 bar
Maximum back pressure	25 bar
Temperature rating minimum	-20°C
Temperature rating maximum	+60°C

Recommended Oil

Mineral based hydraulic	ISO VG37
Filtration minimum	25 micron

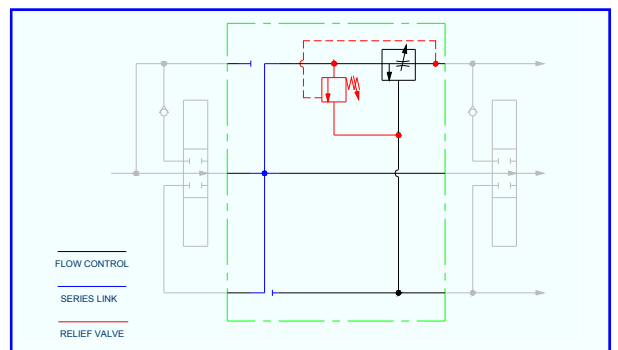
Materials

Body - Aluminium	BS 1490
Needle - Stainless Steel	EN58AM
External protection	Zinc chromate
	BS 1706 Zn3
	Nitrotech NQ3
	Nitrile/PTFE

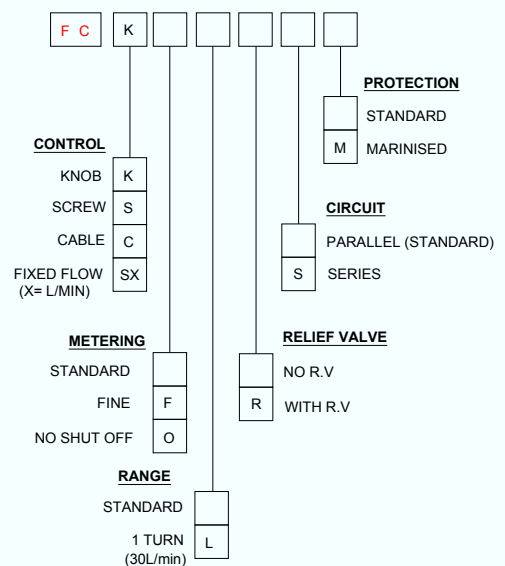
Seals

Weight
FCNK

0.9 kg



ORDER CODE



V5 INTERSECTIONS

ELECTRICALLY OPERATED FLOW CONTROL

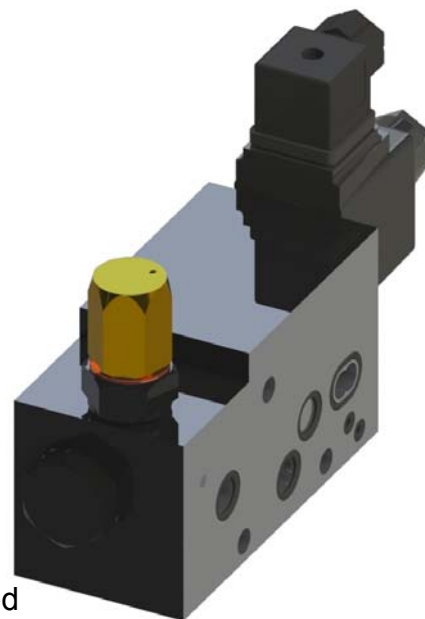
The FCE electrically operated flow control has been added to the V5-60 spool valve range. This section enables the user to vary the flow in a bank of valves by remotely varying the voltage to the flow control solenoid.

The priority type pressure compensated flow control varies the flow available to the down stream sections in the valve chest. If used in conjunction with the V5-60 solenoid valves complete remote control can be achieved electronically. By using the V5-60 micro switch on a manual section to give a pre-set voltage to the flow control solenoid, a differing flow can be obtained from each section.

When used in conjunction with a proportional driver plug, the control is obtained with a 10k Ω potentiometer or 0 to 10V DC external signal.

Description

A pressure compensated, meter in, type flow control with a solenoid controlled metering orifice. The orifice is adjusted by varying the power to the coil. When used with a proportional driver plug the orifice can be adjusted with a 10K Ω potentiometer or 0 to 10V DC signal from control circuitry.

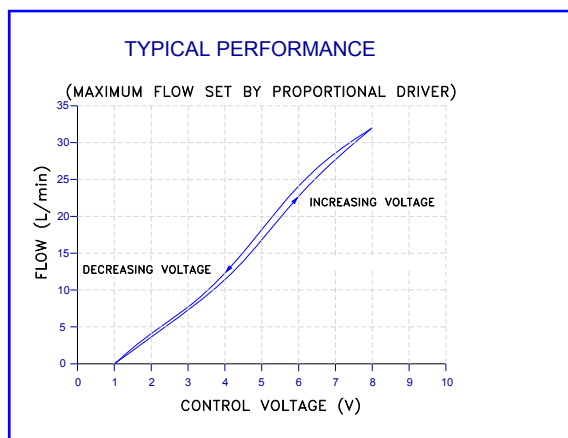


Application

Used to control the speed of hydraulic motors or cylinders remotely. (Electronically controlled). Used extensively in the mobile industry to control the speed of conveyors and also in the recovery industry to control the speed of winches.

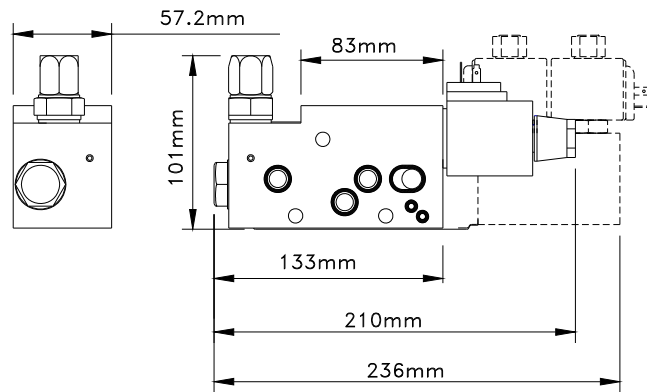
Features

- Fast response 0 to max.
- Low hysteresis.
- Good linearity.
- Pressure compensated.
- Proportional driver plug option.
- Relief valve.
- Series connection.



V5 INTERSECTIONS

INSTALLATION DETAILS



Technical Data

Performance

Rated flow	60 l/min
Adjustable range	0–60 l/min
Δp inlet to outlet at 60 litres/min	0.9 bar
Δp inlet to service	6.9 bar
Maximum pressure	210 bar
Maximum back pressure	25 bar
Temperature rating minimum	0°C
Temperature rating maximum	+ 60°C

Electrical

Coil voltage nominal	12 or 24V DC
Coil power	38 watt
Protection	IP65
Connection	DIN 43650
Cable Ø (not supplied)	6 - 8mm
Proportional driver plug	XPRO 932

Recommended Oil

Mineral based hydraulic	ISO VG37
Filtration minimum	25 micron

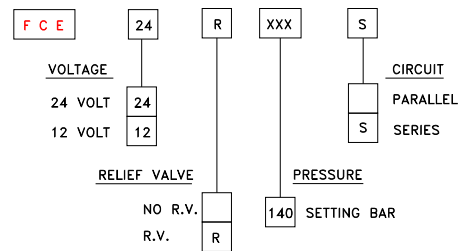
Material

Body – Aluminium	BS 1490
External plating – zinc chromate	BS 1706 Zn3
Seals	Nitrile/PTFE
Tie stud torque	13.5 Nm

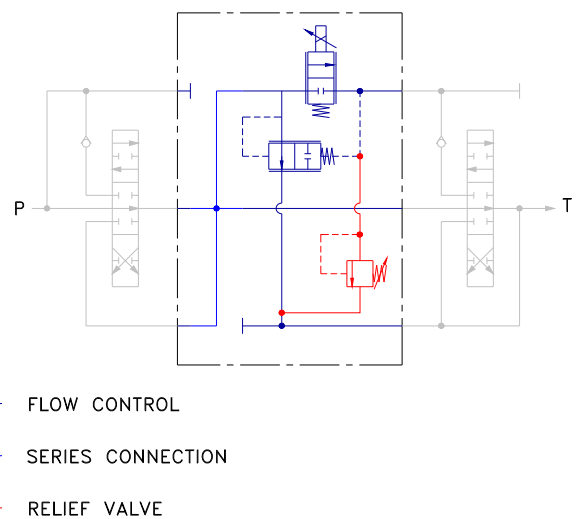
Weight

FCE	1.3 Kg
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ORDER CODE



CIRCUIT DIAGRAM



V5 INTERSECTIONS

FLOW DIVIDER

The Hy-Pro flow divider inter-section allows two hydraulic circuits to be built into one valve assembly. Flow is fed directly to the section. The adjustable priority flow is fed to the left hand sections and the remaining flow to the right hand sections, thus allowing two circuits to be run simultaneously and independently. A series link can be incorporated in the flow divider section, re-combining the flow and feeding the full flow to the right hand sections, whilst maintaining priority flow to the left hand sections. The pressure compensated flow divider can be supplied with either a graduated knob for continuous adjustment or preset with a lock nut.



Description

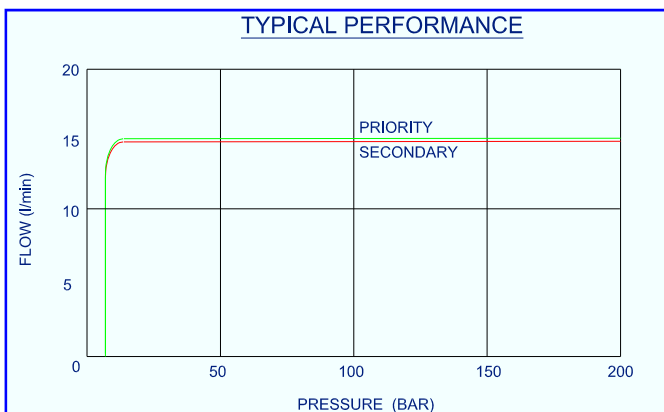
Adjustable flow divider cartridge housed in a manifold. The flow divider continuously senses the pressure drop across the priority control orifice, maintaining the selected priority flow. The adjustable priority flow is unaffected by variable pump delivery or pressure changes in either priority or secondary circuits.

Application

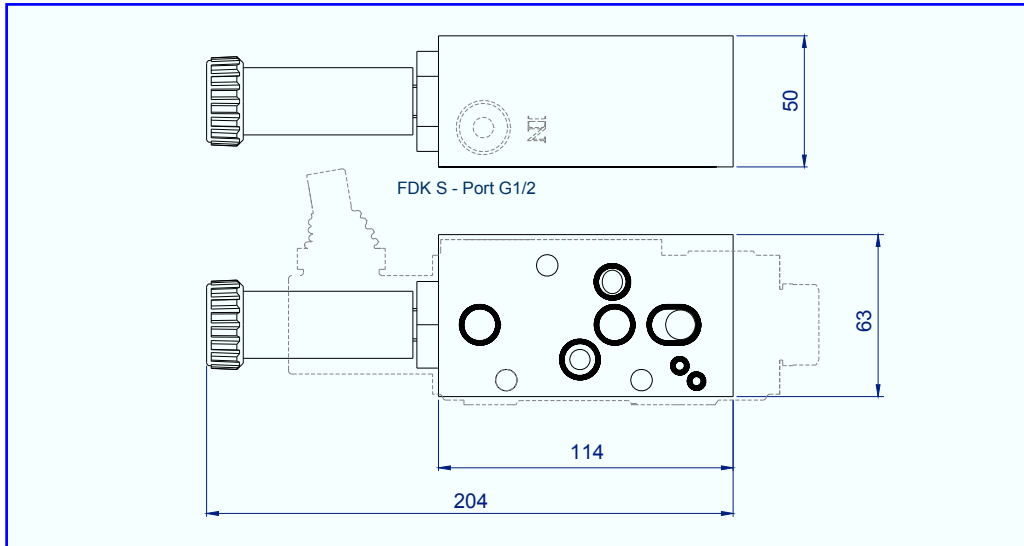
Used in applications requiring a single pump to drive an actuator and a motor, or a pair of motors simultaneously, with variable loads. Typically conveyor motors used in road surface treatment and feeder wagons for the agricultural sector.

Features

- Variable priority flow.
- Pressure compensated.
- Compact cartridge design.
- Graduated knob.
- Series link option.
- Screw and locknut option
- Hardened and ground components for long life.



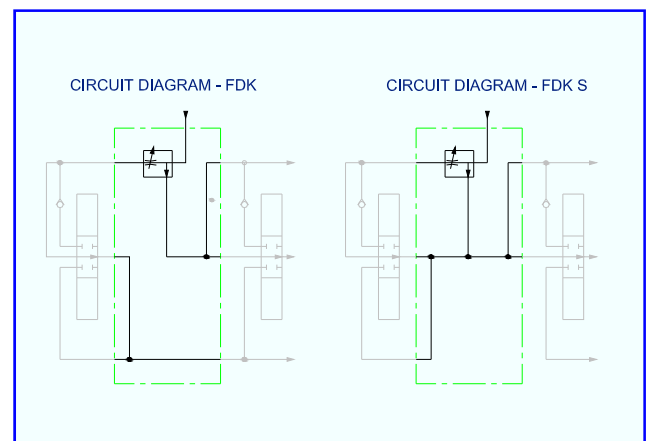
V5 INTERSECTIONS



Flow Divider Specification

Performance

Rated flow	60 L/minute
Priority flow maximum	36 L/minute
Priority flow minimum	0 L/minute
ΔP inlet to service	6.9 bar
Maximum pressure	250 bar
Temperature rating minimum	-20°C
Temperature rating maximum	+65°C



Recommended Oil

Mineral based hydraulic	ISO VG37
Filtration (minimum)	25 micron

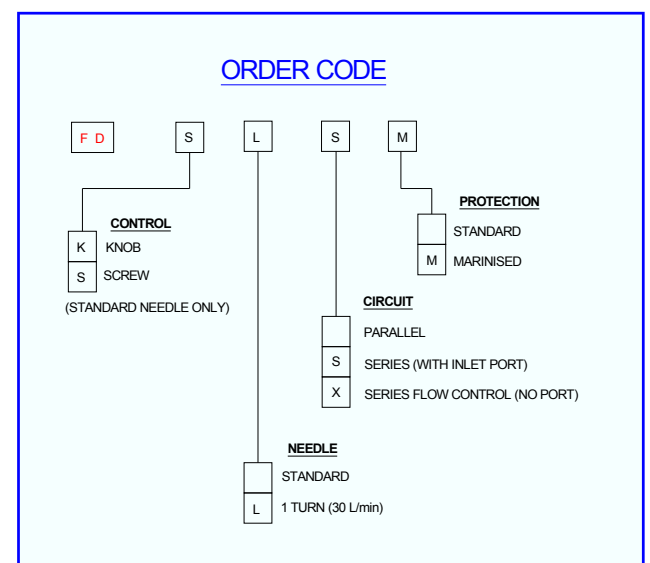
Materials

Body – aluminium	BS 1490
Needle – stainless steel	EN58AM
External protection	Zinc chromate
	BS 1706 Zn3
	Nitrotech NQ3
	Nitrile/PTFE

Seals

Weights

FDK	0.9 Kg
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V5 INTERSECTIONS

V5-60 PROPORTIONAL SOLENOID FLOW DIVIDER

The Hy-Pro electrically operated flow divider section allows two hydraulic circuits to be built into one valve assembly and the flow to each circuit adjusted remotely. Oil is fed directly to the section, the priority flow is fed to the left hand sections and the remaining secondary flow to the right hand sections, thus allowing two circuits to be run simultaneously and independently.

Description

Proportional flow divider cartridge housed in a manifold. The flow divider continuously senses the pressure drop across the priority control orifice, maintaining the selected priority flow. The adjustable priority flow is unaffected by variable pump delivery or pressure changes in either priority or secondary circuits. Control is via a proportional driver cartridge and 10K Ω Potentiometer.

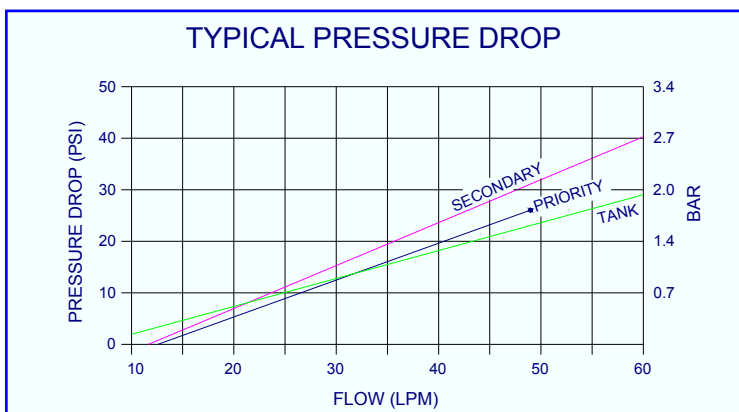


Application

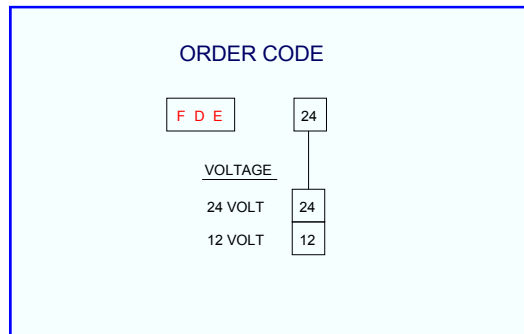
Used in applications requiring a single pump to drive an actuator and a motor, or a pair of motors simultaneously, with variable loads. Typically conveyor motors used in road surface treatment and feeder wagons for the agricultural sector.

Features

- Variable priority flow.
- Pressure compensated.
- Series link option.
- Can be used with manual and solenoid valve sections
- Hardened and ground components for long life.
- Proportional control driver



V5 INTERSECTIONS



Technical Data

Performance

Rated flow	60 L/minute
Priority flow range	0-60 L/minute
Secondary flow range	0-60 L/minute
ΔP inlet to tank 40 lpm	2.0 bar
ΔP inlet to priority service 40 lpm	1.6 bar
ΔP inlet to secondary service 40 lpm	2.0 bar
Maximum pressure	250 bar
Temperature rating minimum	-20°C
Temperature rating maximum	+65°C

Recommended Oil

Mineral based hydraulic	ISO VG37
Filtration (minimum)	25 micron

Materials

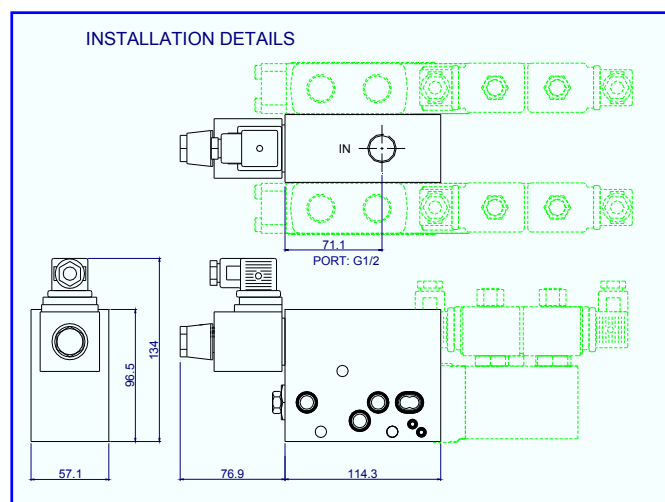
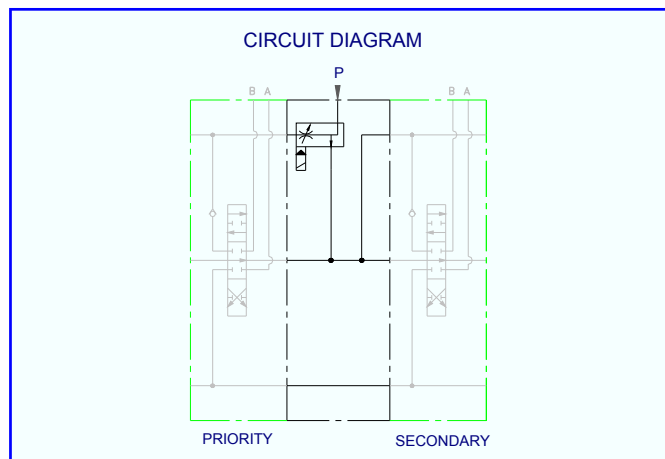
Body – aluminium	BS 1490
Cartridge – steel nitrotec	NQ3
– steel case hardened	BS 019
Seals	Nitrile/PTFE
Tie stud torque	13.5 Nm

Weights

FDE 12 & 24	1.5 Kg
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Electrical

Coil Power	38 watts
Protection	IP65
Connection	DIN 43650
Proportional Driver	XPRO932
Cable Ø (not supplied)	6 - 8mm



V5 INTERSECTIONS

SOLENOID UNLOADER INTERSECTION

Designed to rapidly unload the pressure gallery to tank when power to the coil is interrupted. Can be used in both manual and solenoid operated valve assemblies as an emergency stop to override the other controls of the valve bank.

This intersection complements the range of options available for the V5 and makes it one of the most versatile valves in the Hy-Pro range.

Description

The intersection houses a normally open bypass cartridge valve which rapidly unloads the pressure gallery to tank when the solenoid coil is de-energized. When the coil is energized the bypass valve closes and the pressure is restored to the valve bank. The optional manual override can restore hydraulic operation in the event of electrical failure. A further option is the incorporation of an adjustable piloted relief valve.

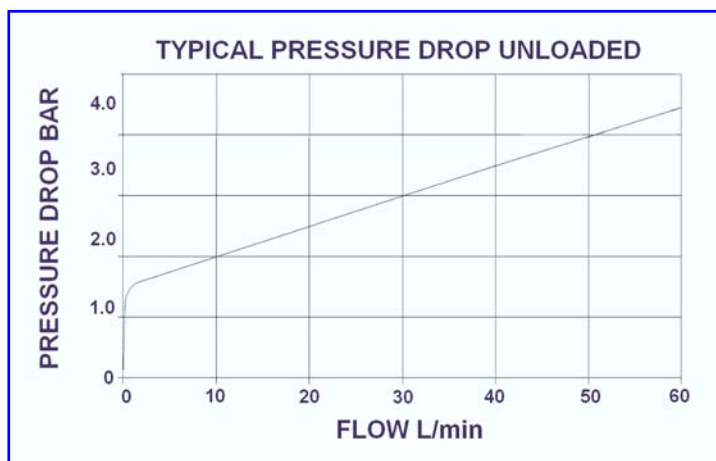


Application

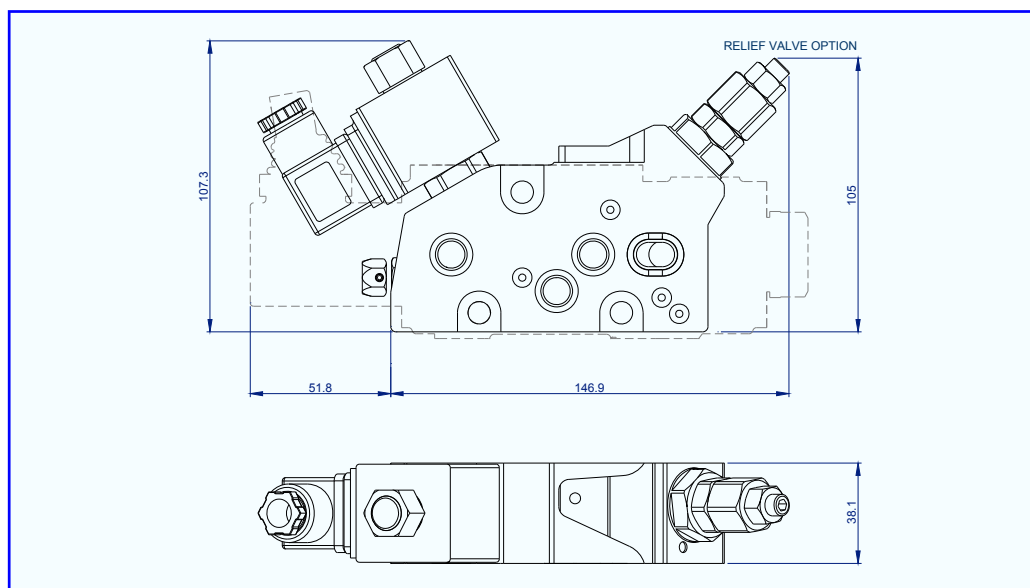
Required in recovery vehicle applications where winching controls must have a second control to stop the winch. Can also be used as an interlock system to prevent operation when the electrical circuit is broken.

Features

- 12Vdc or 24Vdc
- Optional manual override.
- Optional relief valve.
- N/O or N/C cartridge options
- Hardened and ground components for long life



V5 INTERSECTIONS



Solenoid Unloader Section Specification

Performance

Related flow	60 l/min
ΔP inlet to outlet at 60 l/min	0.9 bar
Maximum pressure	210 bar
Maximum back pressure	25 bar
Temperature rating: minimum	-20°C
Temperature rating: maximum	+65°C

Electrical

Coil voltage nominal	12V or 24V
Coil power	24W
Protection	IP65
Connection	DIN 43650

Recommended Oil

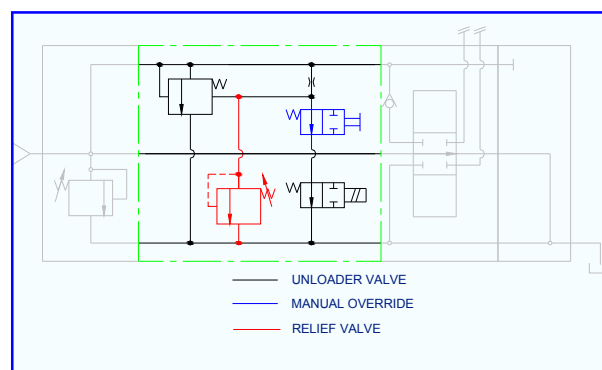
Mineral based hydraulic	ISO VG37
Filtration minimum	25 micron

Material

Body aluminium	BS 1490
External protection	Zinc chromate BS 1706 Zn3 Nitrotech NQ3

Seals	Nitrile & PTFE
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Weight	1.7kg
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ORDER CODE

U	S	XXX	12
MANUAL OVERRIDE		RELIEF VALVE PRESSURE	VOLTAGE
SCREW OPERATED	S	NOT REQUIRED	
NOT REQUIRED		70 BAR	12 12 VOLT
		100 BAR	24 24 VOLT
		140 BAR	
		170 BAR	
		210 BAR	

V5 INTERSECTIONS

SERIES CONNECTOR

Hy-Pro series connectors are designed to be fitted between two valve sections, connecting in series the actuators that they control. Series connectors are often used to synchronize two hydraulic motors where the return oil from one is fed to the inlet of the second.

The series connector effects only the valve sections immediately upstream and downstream of its position in the valve bank. Other sections remain connected in parallel. When using the series connectors, consideration must be given to upstream sections. This is because the normally open tank gallery in the valve bank is pressurized when the series connected actuators are on load. If this is a problem specially designed inlet covers are available which contain a separate outlet port for the relief valve bypass flow.



Special provision has also to be made for ancillary valves when used with series-connected valve banks. In such cases, customers are advised to discuss their circuit design with Hy-Pro.

Description

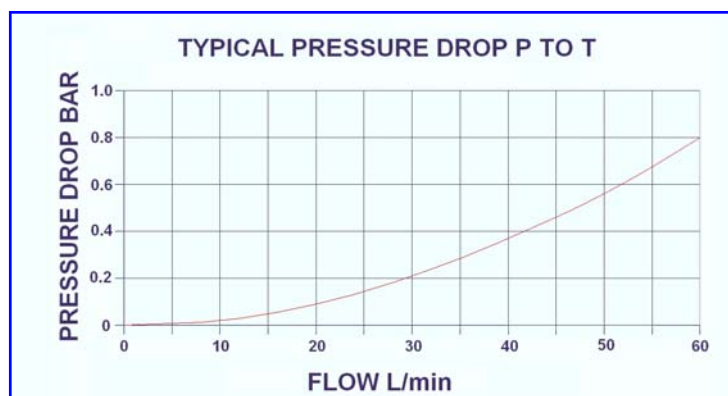
This intersection connects the up stream tank galleries to the pressure galleries of the down stream section enabling the flow to power a second service .

Application

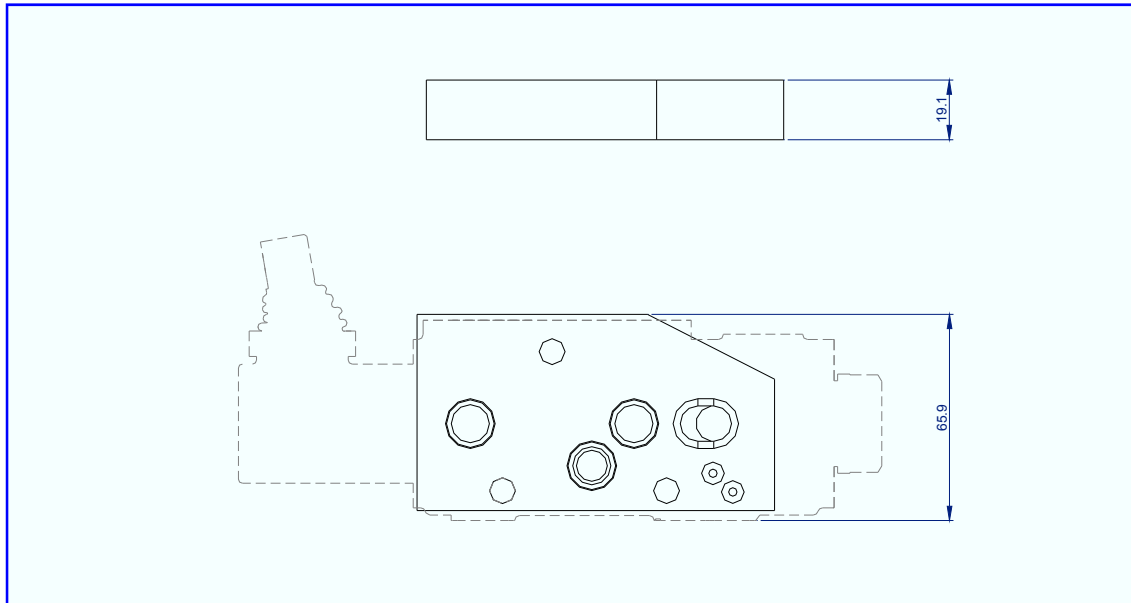
Used where two or more services are required to operate simultaneously with differing loads. Often used to synchronize two hydraulic motors.

Features

- Used with standard sections.
- Converts both manual and solenoid sections.
- Anodised option



V5 INTERSECTIONS



Series Connector Specification

Performance

Rated flow	60 l/min
Max pressure	250 bar
Δp at rated flow P to T	0.8 bar
Temperature rating minimum	-20°C
Temperature rating maximum	+65°C

Recommended Oil

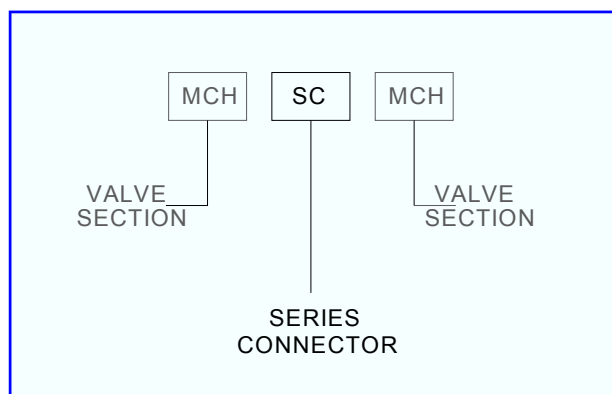
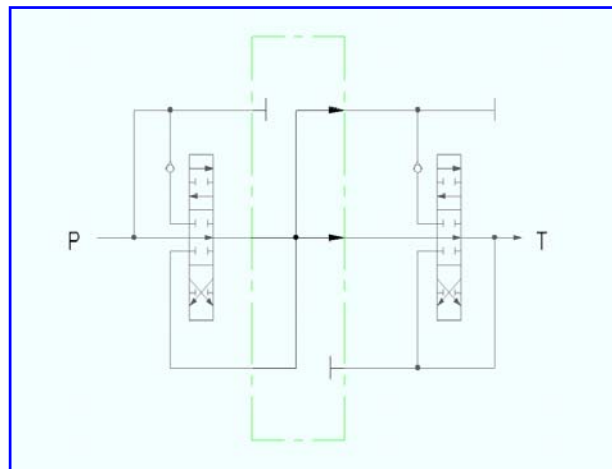
Mineral based hydraulic	ISO VG37
Filtration (minimum)	25 micron

Materials

Aluminium	BS1490
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Weight

0.3kg



V5 INTERSECTIONS

SERIES PARALLEL CONNECTOR

The V5 series parallel connector is used to give priority to up stream sections.

The pressure gallery is isolated from down stream sections when the up stream section is selected. If the up stream section is single acting, the pressure gallery is only closed when in the raised position, i.e. the down stream sections will have a pressure feed when in the lower position.

The Hy-Pro series parallel connector can be used in manual and solenoid valve assemblies to provide an interlock or ensure a service is activated in the correct sequence.



Description

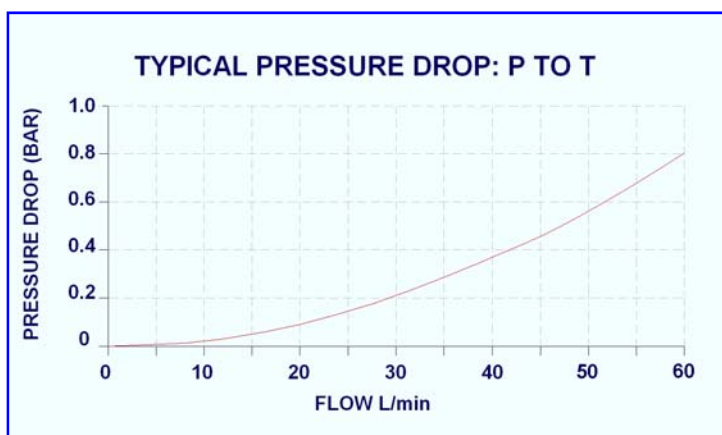
An intersection to provide series parallel connection. Flow is only passed to the down stream control sections when the upstream control section is in neutral.

Application

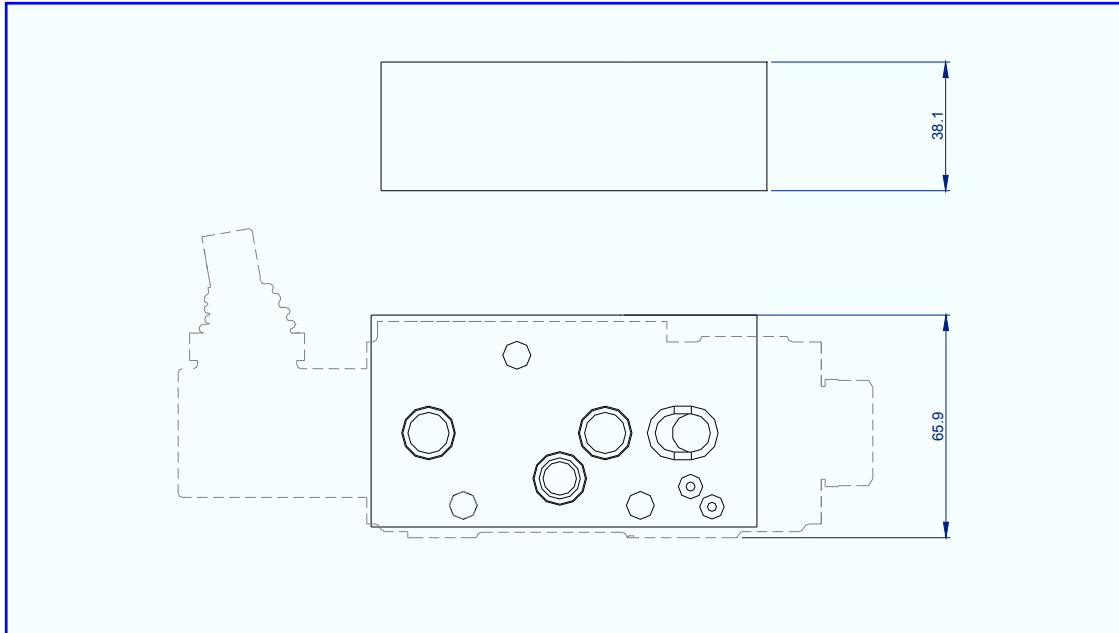
Use to give priority to control sections or provide an interlock. Can be used between each section to ensure only function can be used at a time, simplifying the operation of the machine.

Features

- Compatible with manual and solenoid valves.
- Compact.
- Anodised option



V5 INTERSECTIONS



Series Parallel Connector Specification

Performance

Rated flow	60 l/min
Maximum pressure	250 bar
Temperature rating min	-20°C
Temperature rating max	+65°C

Recommended Oil

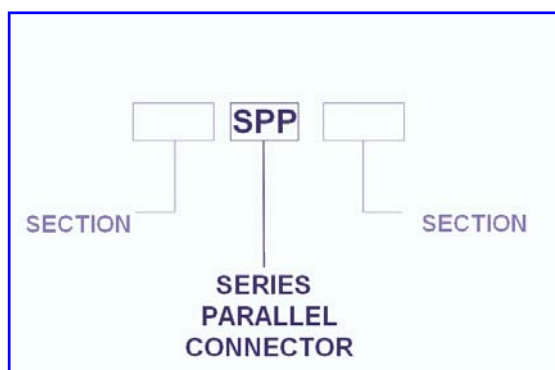
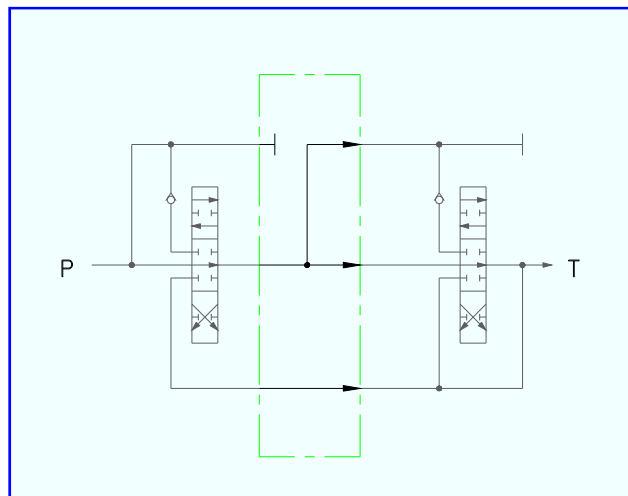
Mineral based hydraulic	ISO VG37
Filtration (minimum)	25 micron

Materials

Body Aluminium	BS 1490
Seals	Nitrile

Weight

0.53 kg



V5 INTERSECTIONS

MID-INLET SECTION

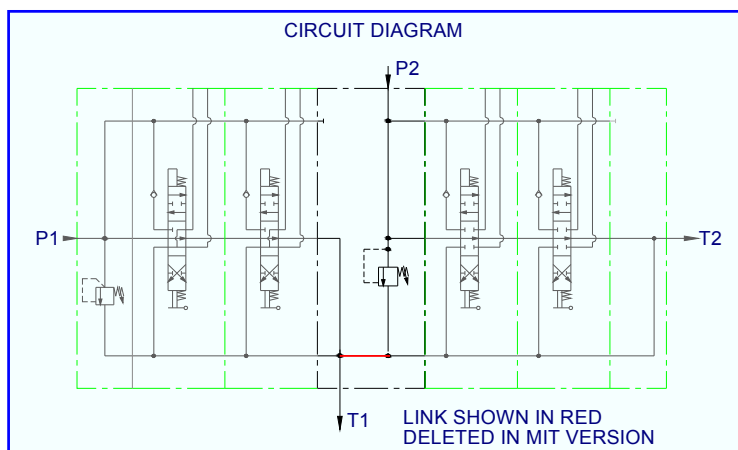
A mid inlet section is used to enable two separate control valves to be built into one assembly. The first valve is fed from the inlet cover whilst the second is fed by the mid-inlet. An adjustable relief valve is included to protect the pump supplying the sections fed by the mid-inlet. The mid inlet section combines elements of our standard inlet and outlet covers thus permitting a very compact installation with less hoses and connections than two separate valve banks.



Options are available to have the outlet flow from both sides of the assembly combined into one outlet (MI) or as 2 separate outlets if the combined return flow is greater than 60 lpm (MIT).

Application

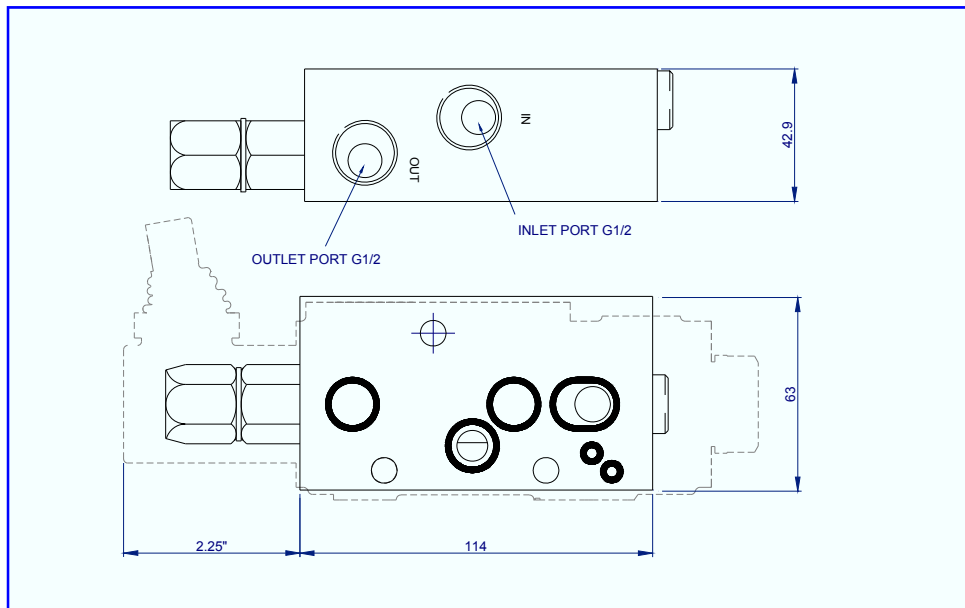
Used to combine two or more valve assemblies into one bank, typically where space is limited. This also allows the control levers to be sited closer together.



Features

- Integral adjustable relief valve.
- 2 outlet port options.
- Anodised option
- Compact section.

V5 INTERSECTIONS



Mid-Inlet Specification

Performance

Rated Flow	60 l/min
Δp at rated flow P to T	0.5 bar
Maximum pressure	250 bar
Maximum back pressure	25 bar
Temperature rating minimum	-20°C
Temperature rating maximum	+60°C
Inlet port	G 1/2
Outlet port	G 1/2

Recommended Oil

Mineral based hydraulic	ISO VG37
Filtration minimum	25 micron

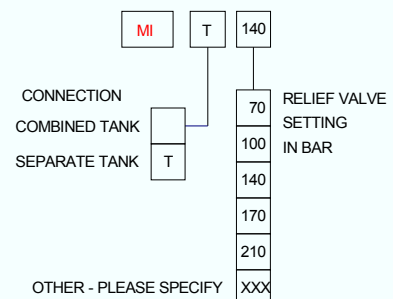
Materials

Body	Aluminium BS 1490
Relief Valve	Zinc chromate BS 1706 Zn3
	Nitrotec NQ3
Seals	Nitrile

Weight

MI RXXX	0.6 kg
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ORDER CODE



V5 ANCILLARIES

PILOT CHECK VALVE

Pilot check valves are used to lock one or both service ports to ensure that there is zero movement of the actuator whilst its control valve is in neutral.

Check valves are mounted using four cap screws on the service port face of a valve section with a 'Y' type manifold interface. Where a single acting check valve is used, the control section must be fitted with an 'M' spool to ensure pilot pressure is available to unlock the check valve.

When used with cylinders, whose rod is large in relation to the diameter of the bore, it is possible for pressures to be generated in the rod end which can not be unloaded. To avoid this the ratio of the cylinder full area to the rod annular area must not be greater than 4:1, which is the pilot ratio of this check valve.

When lowering a cylinder, the pump may not maintain the pilot pressure. This can result in jerky operation caused by oscillation of the pilot piston. This can be overcome by restricting the flow out of the cylinder to maintain pilot pressure at the check valve.

Description

Designed to be mounted directly onto the service port face of the V5 'Z' section. Chrome steel ball and hardened seats provide a positive and total lock to actuators, this cannot be released unless the pump is running and the valve is selected.

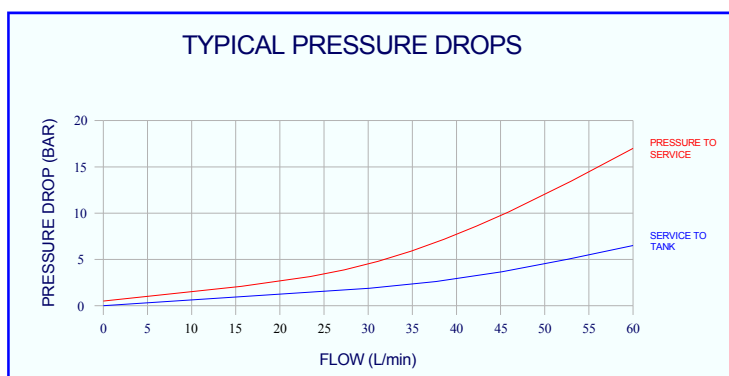


Application

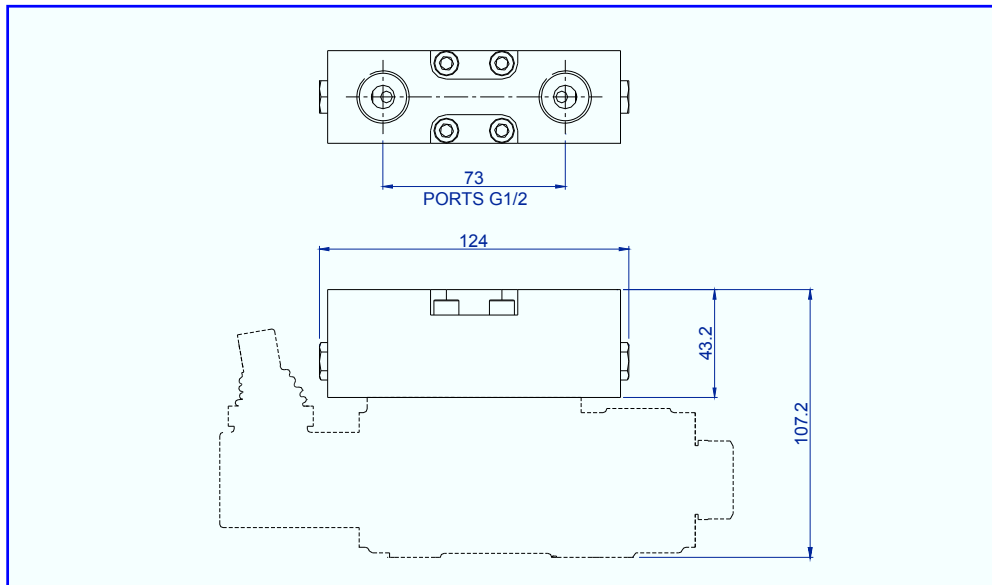
Used to positively lock cylinders and prevent involuntary movement when the pump is not running. Ideally suited to mobile applications such as back hoe and access platforms.

Features

- 4:1 pilot ratio.
- Hardened seats.
- Section mounting.
- 100% production testing.
- Suitable for manual or solenoid sections.
- Good flow characteristics.
- Low opening pressure.
- Cast iron body and hardened piston for long life.



V5 ANCILLARIES



Pilot Check valve Specification

Performance

Rated flow	60 l/min
Maximum pressure	250 bar
Opening pressure	3.0 bar
Temperature rating: minimum	-20°C
Temperature rating: maximum	+60°C
Leakage	0 cc/min
Ratio	4:1

Recommended Oil

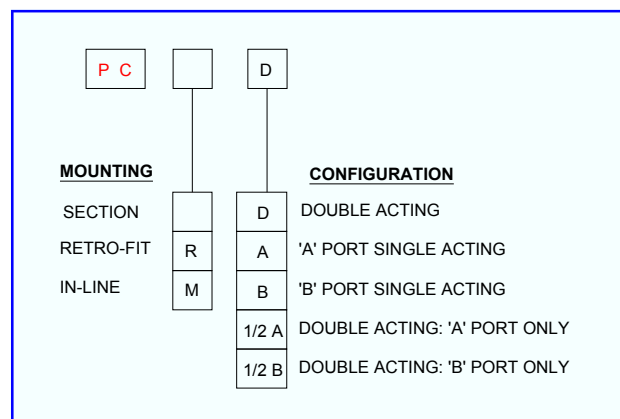
Mineral based hydraulic	ISO VG37
Filtration (minimum)	25 micron

Materials

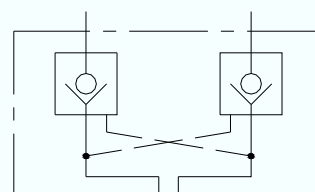
Body - cast iron	BS 1452
External plating - zinc chromate	BS 1706 Zn3
M6 cap screw torque	8.0 Nm
Seals	PTFE/Nitrile
Mounting interface	Z type

Weight

1.16kg



CIRCUIT DIAGRAM



V5 ANCILLARIES

SERVICE LINE RELIEF & ANTI- CAVITATION

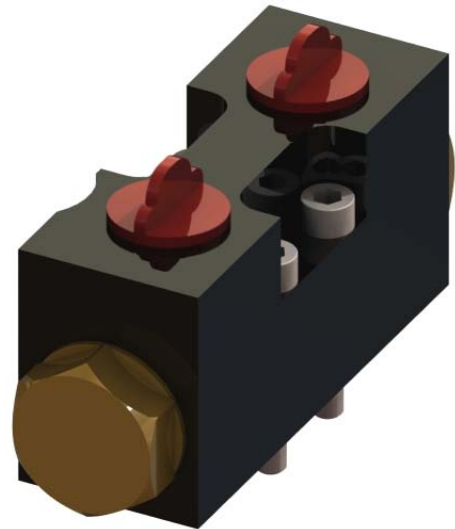
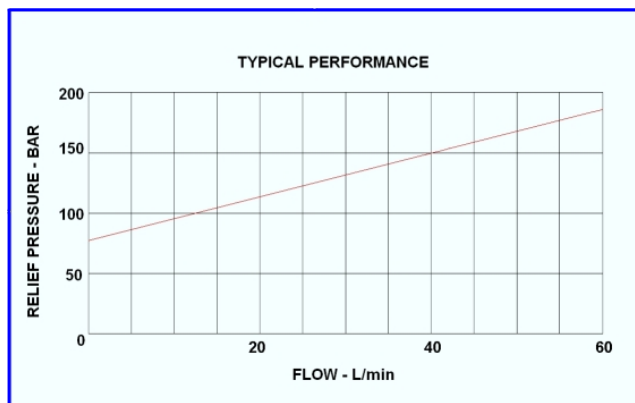
The V5 service line relief valve is used to limit the pressure in individual service lines and provide anti-cavitation protection in circuits with overrun situations to maintain oil in the actuators.

The valve is mounted onto the service port face of a "Z" type valve section using four cap screws. The body has a cavity for each service line. This will accept one of four cartridges, relief, anti-cavitation, relief and anti-cavitation or a blanking cartridge.

Relief valves are pre-set by Hy-Pro, but are fully adjustable retrospectively using the socket screw located under the cap nut. The Hy-Pro service line relief valves and anti-cavitation valves can be used on manual, cable and solenoid operated sections.

Description

The body is machined to accept one of four cartridge options for each service line. The cartridges are relief, anti-cavitation, relief and anti-cavitation and blanking cartridge. The relief valves are adjustable.



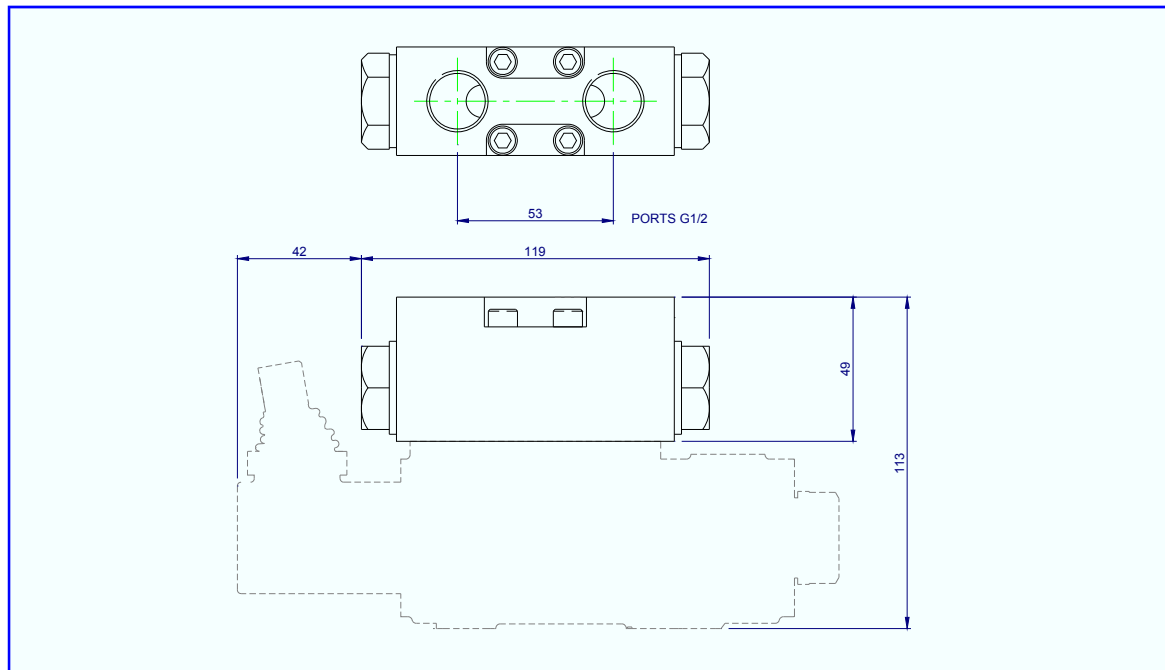
Application

Used to protect one or both service lines from being over pressurized, it is effective when the main spool is selected or in neutral. The anti-cavitation cartridge allows oil to be drawn into the service line should the demand over take the pump supply.

Features

- Fast responding, adjustable direct acting relief valve.
- Large capacity anti-cavitation
- Compact construction.
- Relief and anti-cavitation in each port option.
- Hardened relief and anti-cavitation pistons for long life.

V5 ANCILLARIES



Service Line Relief Valve Specification

Performance

Rated flow	60 l/min
Maximum pressure service	250 bar
Maximum back pressure - outlet port	25 bar
Relief valve range	20 bar to 205 bar
Anticavitation	0.5 bar
Temperature rating minimum	-20°C
Temperature rating maximum	+65°C

Recommended Oil

Mineral based hydraulic	ISO VG37
Filtration minimum	25 micron

Materials

Body - Aluminium	BS 1490
External plating - zinc chromate	BS 1706 Zn3
Seals	PTFE & Nitrile
Cap screw torque	8.0 Nm

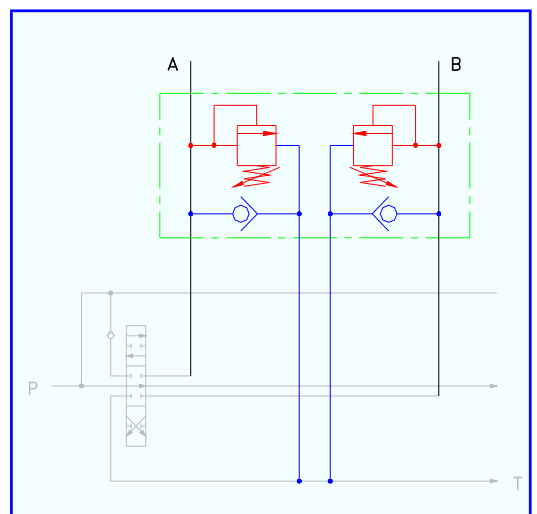
Mounting interface

Z type

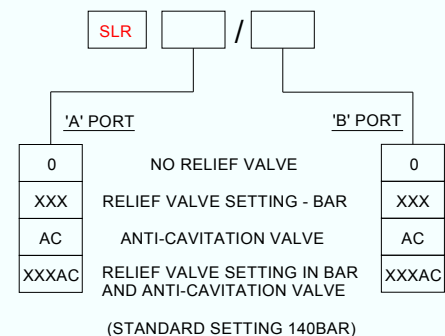
Weight

SLR 140/140

0.53 kg



ORDER CODE



V5 ANCILLARIES

V5-60 SOLENOID 4-POSITION FLOAT VALVE

The Hy-Pro electrically operated 4 position valve connects both sides of a double acting cylinder to tank allowing it to float. For example when used on grass cutting or snow ploughing equipment the blades will follow the contours of the ground when the solenoid is actuated.

Description

The valve contains our standard solenoid cartridge as used in the solenoid sectional valves. In this application it is in the Normally Closed configuration.

The valve is mounted to a Z-face double acting solenoid section (Ref. page 47) and is used in conjunction with that valves functions to achieve the raise / hold / lower / float positions.



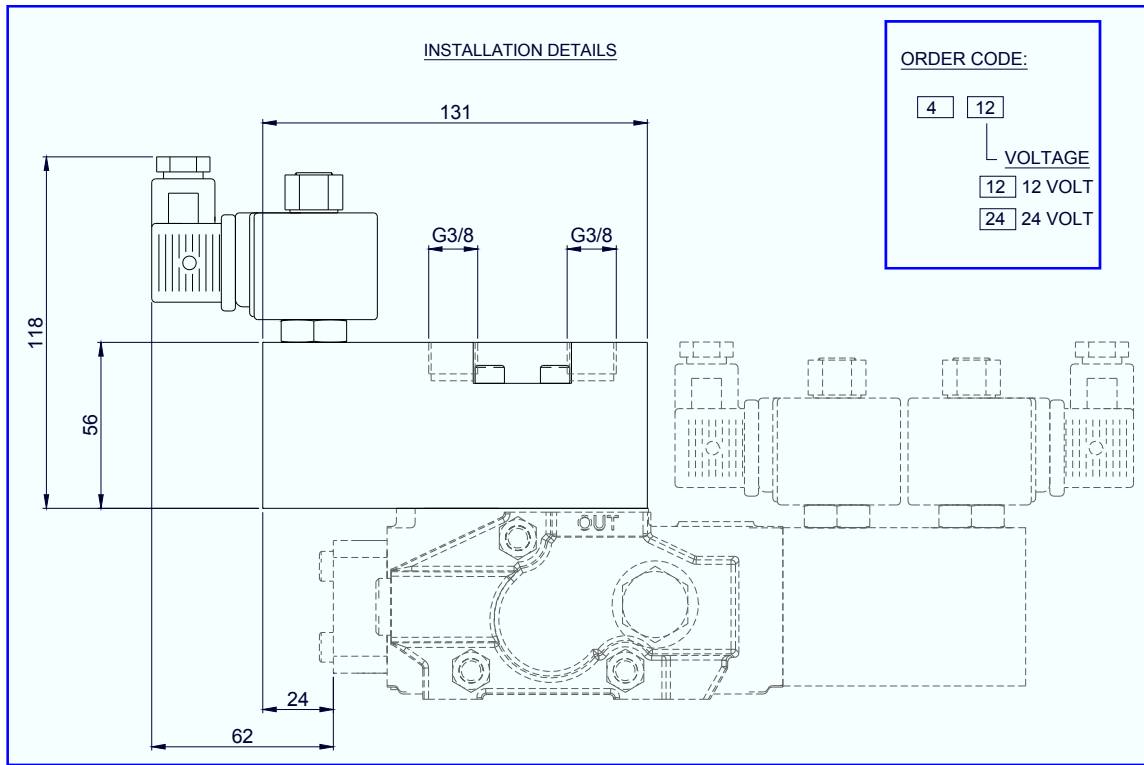
Application

Used in applications requiring a terrain following feature such as ground care, dozers and snow ploughs or a freewheel such as in some winches.

Features

- Can be used with manual and solenoid valve sections
- Suitable for V4 and V5 valves
- Hardened and ground components for long life.

V5 ANCILLARIES



Solenoid 4 Position Section Specification

Performance

Related flow	60 l/min
Maximum pressure	210 bar
Temperature rating: minimum	-20°C
Temperature rating: maximum	+65°C

Electrical

Coil voltage nominal	12V or 24V
Coil power	24W
Protection	IP65
Connection	DIN 43650

Recommended Oil

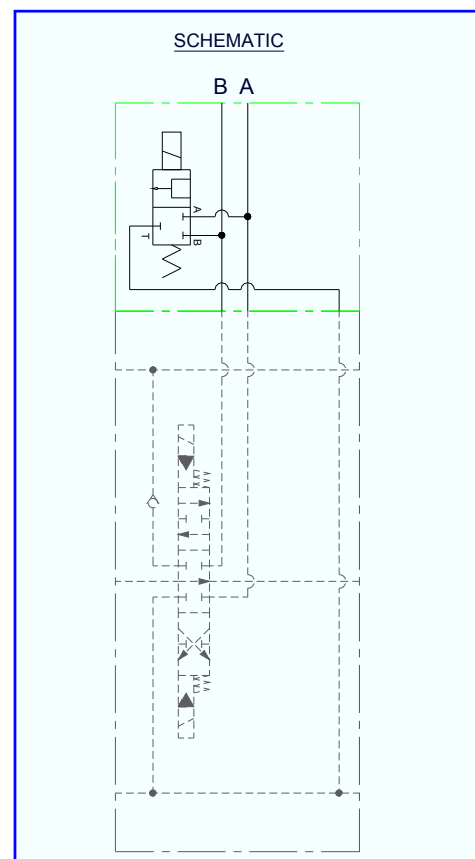
Mineral based hydraulic	ISO VG37
Filtration minimum	25 micron

Material

Body aluminium	BS 1490
External protection	Nitrotech NQ3
Seals	Nitrile & PTFE

Weight

1.0kg



V5 CONTROL

ROTARY LEVER

Description

The Hy-Pro rotary lever has been developed specifically to enable the operator precise control of motors and cylinders in the fishing and other industries.

The lever rotates through a $\pm 65^\circ$ arc and operates a scroll which converts the rotary action of the lever into axial movement of the spool.

The mechanism has a friction detent feature which positively holds the spool in neutral or will maintain the selected position when operated.

Because of the geometry of the lever it is not possible to include it in multi-section valves but it is retro-fitable to existing V5 single section assemblies.

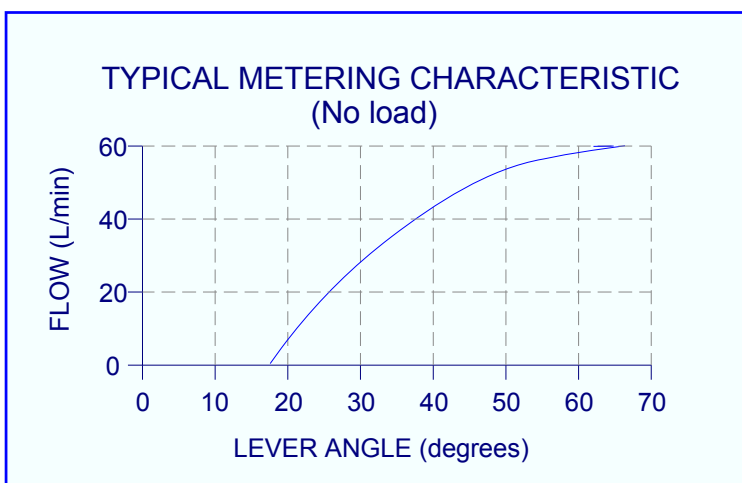


Application

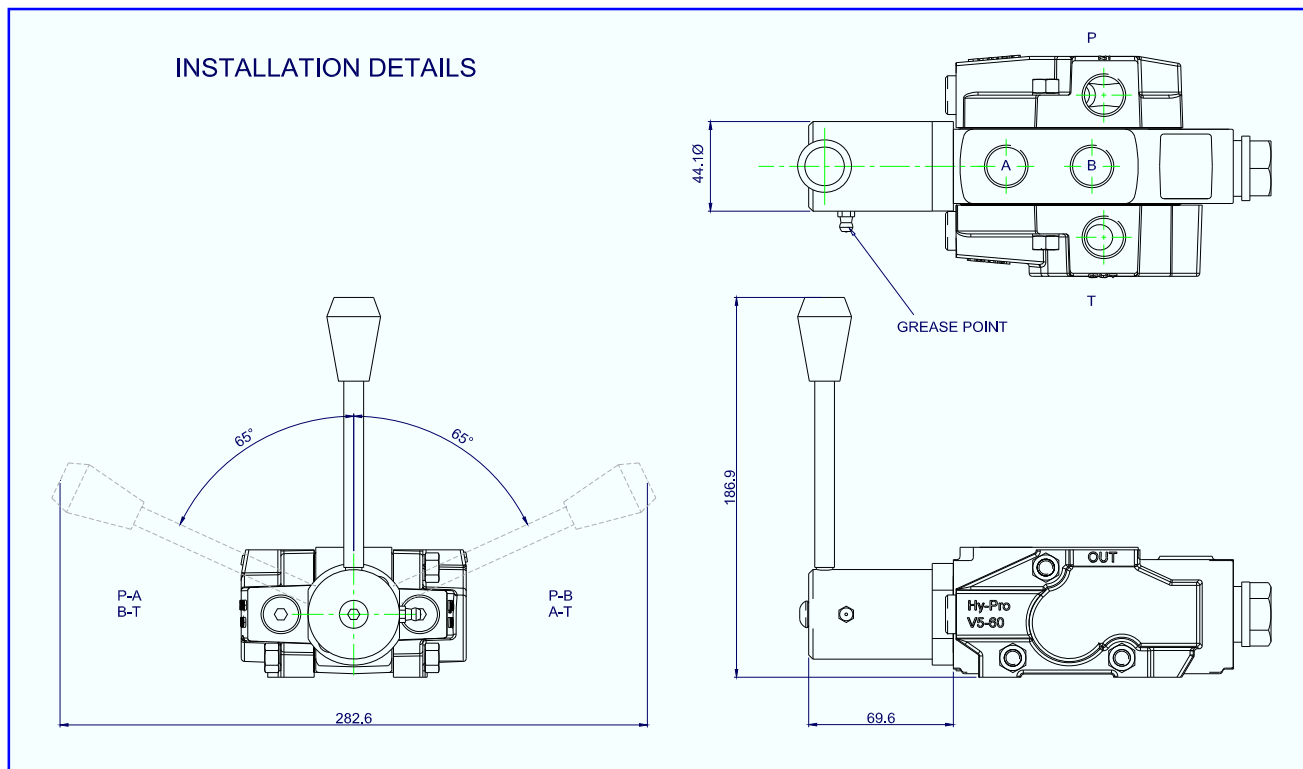
Used extensively in the forestry and fishing industry to control the speed of conveyors and winches.

Features

- $\pm 65^\circ$ movement.
- Compact design.
- Spool options.
- Neutral detent.
- Friction hold.
- Robust mechanism.
- Toughened components.
- Bronze Body and cast iron construction.
- Retro fit-able.



V5 CONTROL



Rotary Lever Specification

Performance

Refer to graph
Lever movement $\pm 65^\circ$

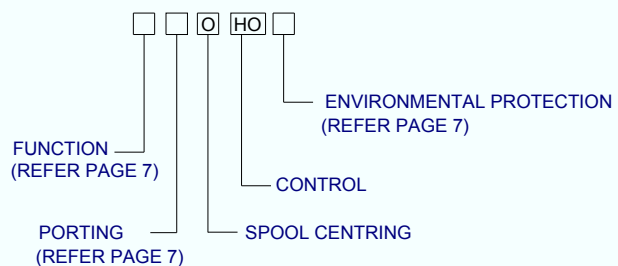
Materials

Body internal Cast Iron BS 1452
Body external Manganese bronze
CZ114

Friction/detent Steel Nitrotech NQ3

Weight 4.9 kg
(Complete assembly
as per drawing)

ORDER CODE



V5 CONTROL

DUAL AXIS LEVERS

The V5 dual axis levers operate two sections either simultaneously or individually, allowing the operator to have total control of two sections using 360 degrees of movement.

The H+ version controls section one in the north and south planes and section two in the east and west. Combinations of movement are achieved between these points.

The HX version controls both sections in the north, south, east and west planes and individual sections between these points.

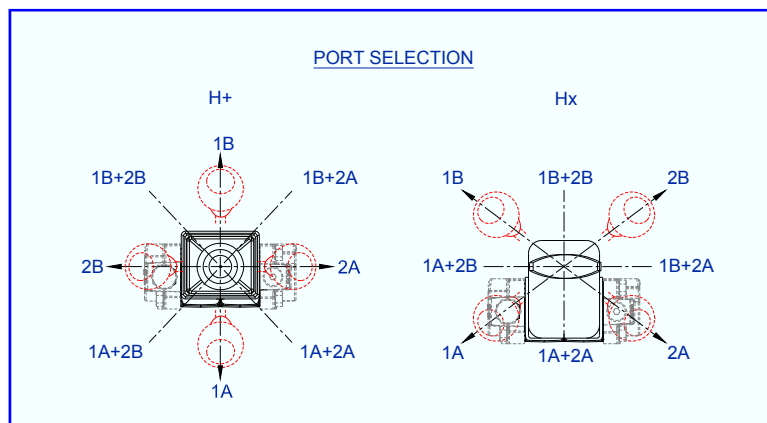


Description

A mounting plate fastened to both sections provides a pivot point for the lever assembly. A yoke is then attached to each spool via ball joints, the 360 degrees of rotation generated is thus converted into reciprocating action for each spool.

Application

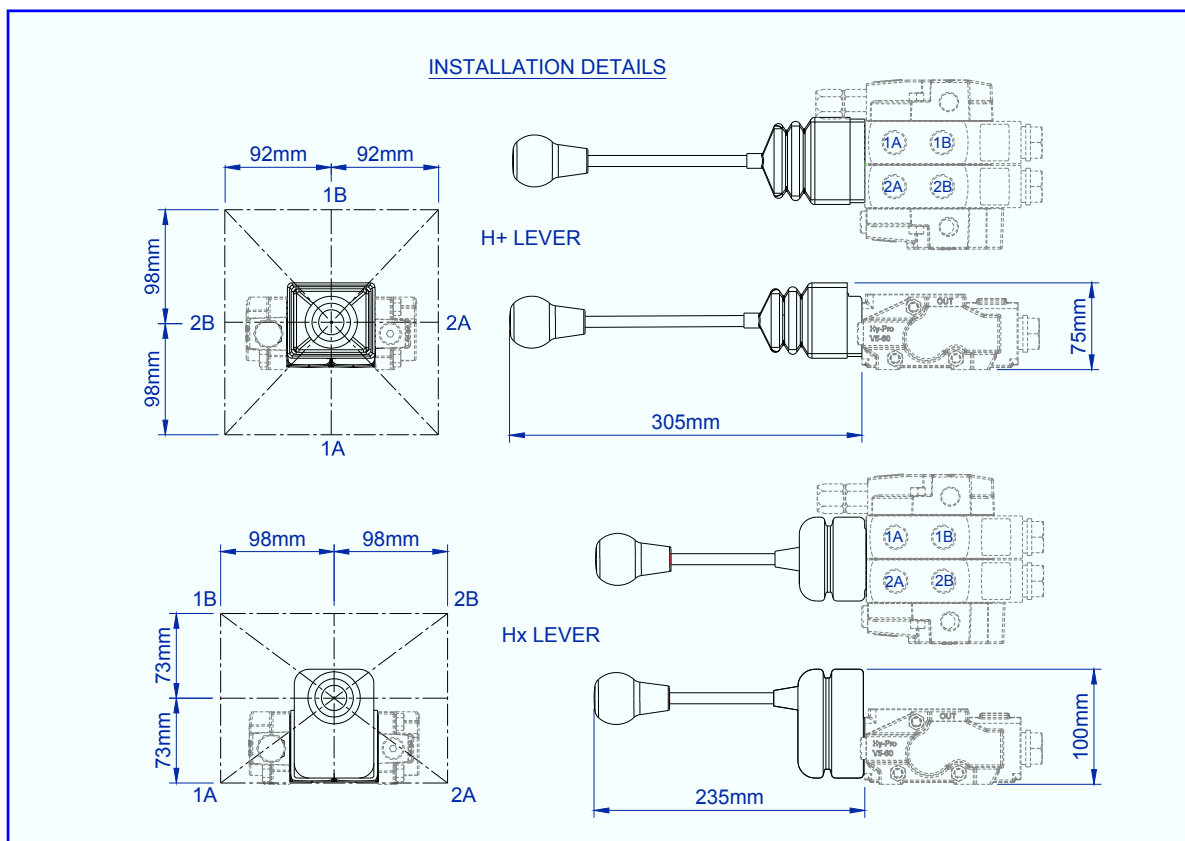
Industry standard for back hoe applications. Used extensively in the construction and mining industry for controlling boom movement. This type of lever is also used to control lorry mounted cranes.



Features

- Smooth operation
- Robust construction
- Precision ball-joints.
- Steel parts.
- Protective gaiter.

V5 CONTROL



Multi Axis Lever Specification

Performance

Minimum operating Force-
 One spool 2.5 kg
 Two spool 5.0 kg

Material & protection

Housing: Aluminium BS 1490
 Yoke: Steel Nitrotech NQ3
 Steel parts: Zinc chromate BS 1706 Zn3

Weights

H+ 0.53 kg
 Hx 0.31 kg

ORDER CODE

