

TECNORD

SERVOCOMANDI E REGOLAZIONE

TRANSMISSION VALVES

Slip-in configuration

MINI SERIES

Electro-Hydraulic Control Valves / Automotive Type

STD CAVITY RANGE

Proportional Pressure Reducing-Relieving Valves / Direct Acting

MID RANGE

Proportional Press. Reducing-Relieving Valves / Step Bore Design

HIGH RANGE

Proportional Press. Reducing & ON-OFF Valves / Pilot Operated



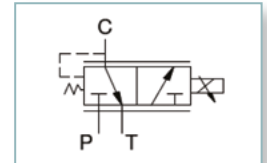
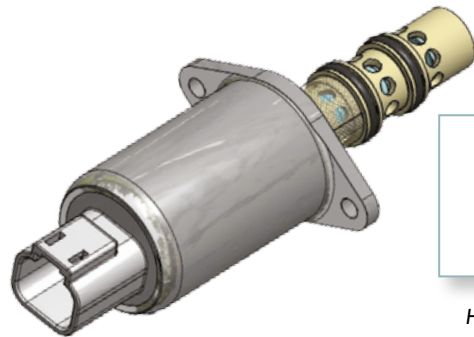
DESCRIPTION

Proportional Pressure Reducing Valves are used to generate a variable pressure in response to a PWM (Pulse Width Modulated) current signal.

PRINCIPLE OF OPERATION

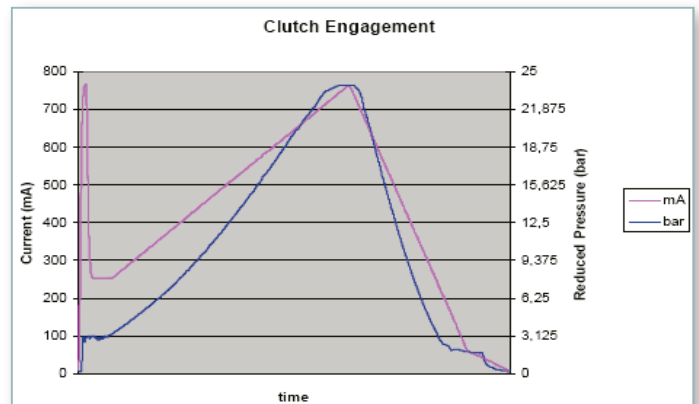
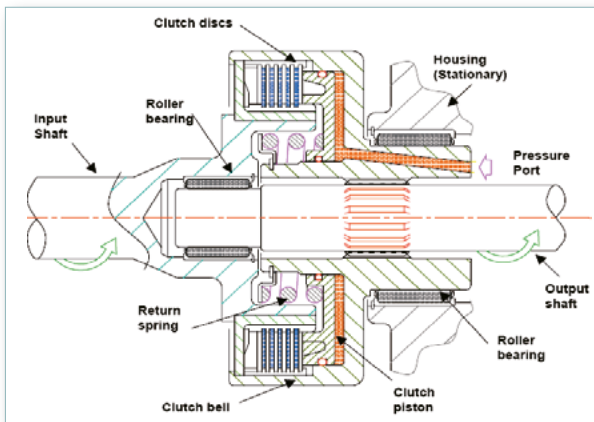
QUICK FILL-UP: a high current peak fed to the proportional solenoid of the PPRV, generates a quick shifting of the valve spool to fill up the gap between clutch discs in the shortest possible time. Clutch discs enter in touch with each other to begin to transfer torque and speed (= power) from the INPUT to the OUTPUT shaft.

SOFT ENGAGEMENT: the PWM current signal is quickly reduced to a minimum value in order to let pressure start from the "kiss point" (2 bar) and then ramp up smoothly to a "high end" (16-18 bar) during which the torque is gradually transmitted to the driven shaft.



Hydraulic Schematic

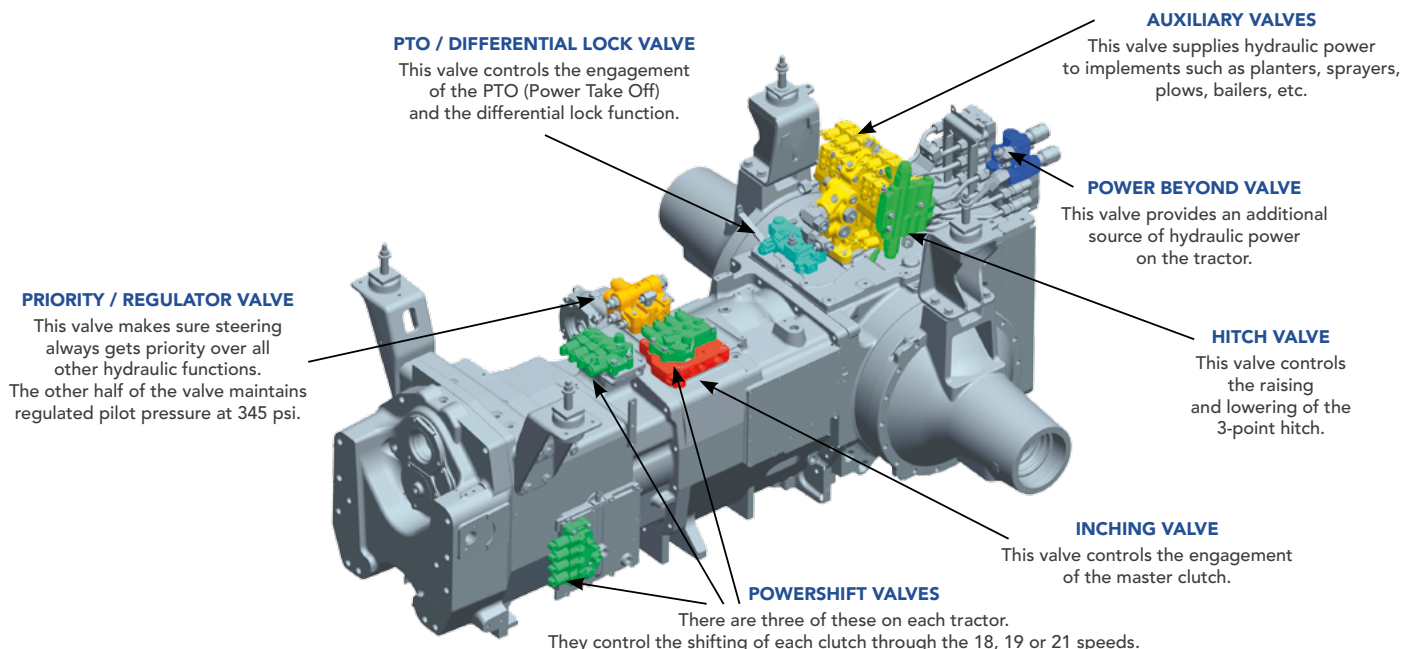
WET DISC CLUTCH SECTIONAL VIEW

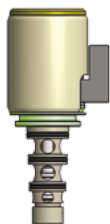


Typical clutch cycle

- Preliminary "quick fill-up" phase at top current until pressure begins to raise within the clutch piston chamber.
- Modulated current ramp to generate a "soft engagement" of clutch discs

TYPICAL LAY-OUT OF POWERTRAIN CONTROL HYDRAULICS FOR AGRICULTURAL TRACTORS





MOD. IP-DNR-T235-AMQ12

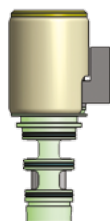
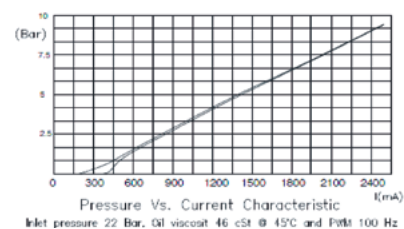
Hydraulic Specifications

Max. Input Pressure	50 bar
Max. Output Flow	12 lt/min
Control Pressure Range	See Graph
Typical Internal Leakage	15 cc/min
Cavity Tool	T235

Electrical Specifications

Coil Resistance	3.2 Ohms
Current Supply Characteristics	See Graph
Superimposed Dither Frequency	150 Hz
Coil Terminations	Amp Micro Quadlock

Proportional Pressure Reducing Valve



MOD. IQ-2WS-T227-AMQ

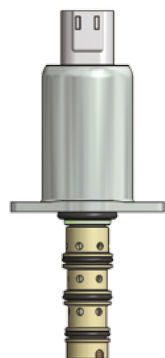
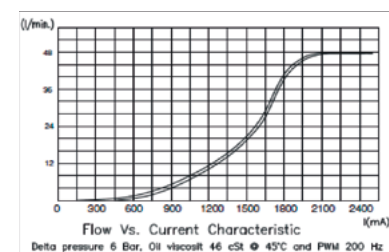
Hydraulic Specifications

Max. Input Pressure	25 bar
Max. Output Flow	45 lt/min
Control Pressure Range	See Graph
Typical Internal Leakage	15 cc/min
Cavity Tool	T227

Electrical Specifications

Coil Resistance	3.2 Ohms
Current Supply Characteristics	See Graph
Superimposed Dither Frequency	150 Hz
Coil Terminations	Amp Micro Quadlock

Proportional Flow Control Valve



MOD. IQ-4WI-T231-DT12

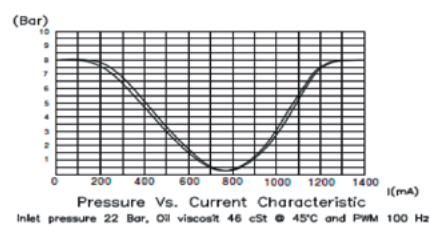
Hydraulic Specifications

Max. Input Pressure	60 bar
Max. Output Flow	8 lt/min
Control Pressure Range	See Graph
Typical Internal Leakage	15 cc/min
Cavity Tool	T231

Electrical Specifications

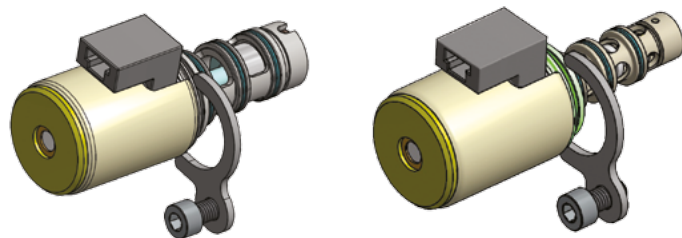
Coil Resistance	5.4 Ohms
Current Supply Characteristics	See Graph
Superimposed Dither Frequency	150-200 Hz
Coil Terminations	Deutsch DTO4

Proportional 4way-2pos Flow Control Valve

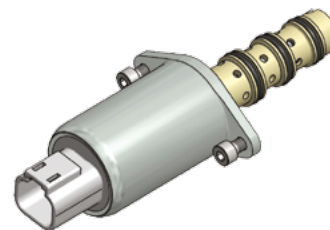


SLIP-IN VALVES - Mounting styles

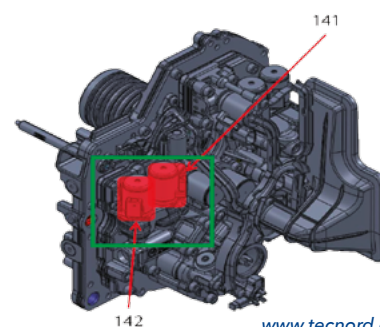
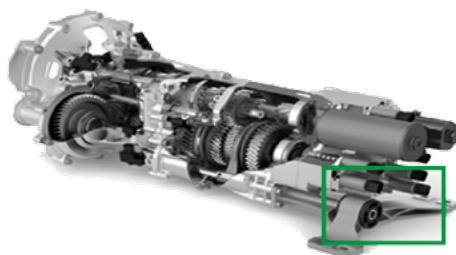
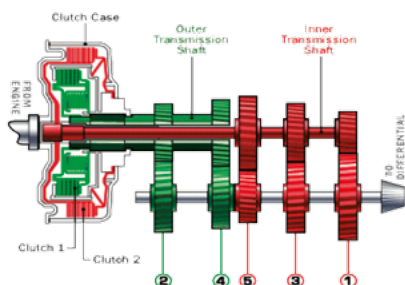
Open Bracket/Single Bolt



Built-in Flange/Dual Bolt



DUAL CLUTCH TRANSMISSION SCHEMATIC



MOD. IP-DAR-T043

Hydraulic Specifications

Configuration	Direct acting / Slip-in type
Max. Input Pressure	50 bar (Std) / 350 bar (Opt)
Max. Output Flow	4 lt/min @ 6 bar Delta-P
Control Pressure Range	See Graph
Typical Internal Leakage at Rest	15 cc/min
Max. Back Pressure at T Port	50 bar
Media Operating Temp. Range	-30°C / +115°C
Oil Viscosity Range	3 cSt / 400 cSt
Max Contamination Level	18/15 (ISO 4406)
Cavity Tool	TCN T043

Electrical Specifications

Coil Resistance	5.4 Ohm (12 VDC) 22 Ohm (24 VDC)
Current Supply Characteristics	PWM (See Graph)
Superimposed Dither Frequency	100 / 150 Hz
Coil Terminations	Amp Junior Timer Deutsch DTO4
Environmental Protection Rating	IP69K
Duty Cycle	100% EDI

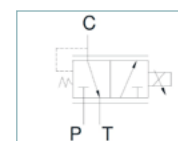
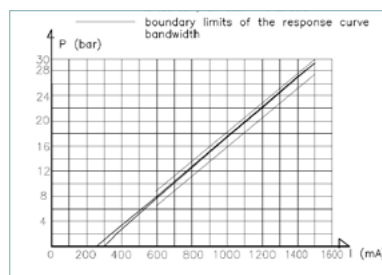
Deutsch DT04 Connector

AMP Junior Timer Connector

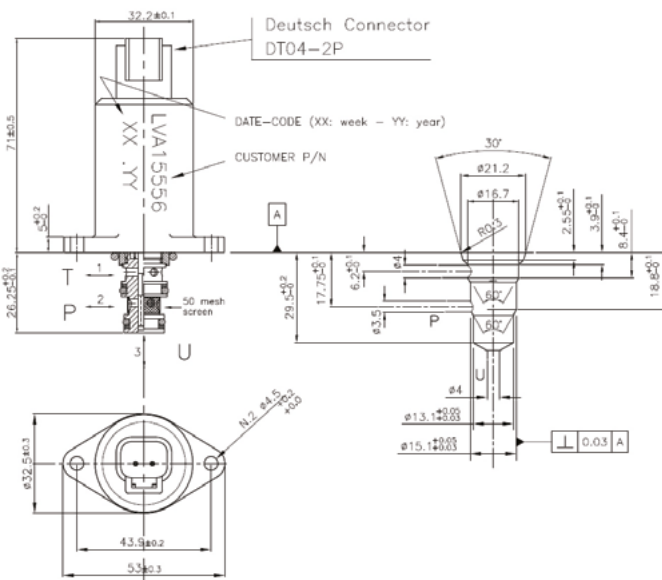


32mm OD

Pressure (bar) vs. Current (mA) Characteristic
12 VDC coil / 5.4 Ohm / Toil = 50°C



Hydraulic Schematic



MOD. IP-DAR-250-DT

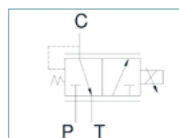
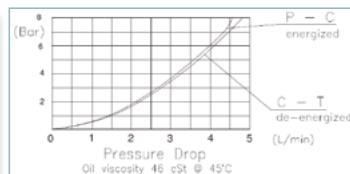
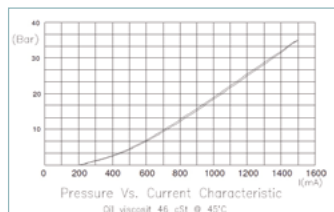
Hydraulic Specifications

Nominal Flow Rate	4 lt/min
Max. Inlet Pressure	50 bar
Controlled Pressure Range	32 bar
Media Operating Temp. Range	-30°C / +120°C
Oil Viscosity Range	3 ÷ 647 cSt
Cavity Tool	T250

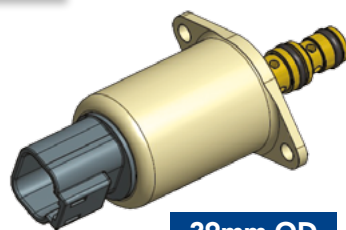
Electrical Specifications

Coil Resistance	4.8 Ohm (12 VDC) at 20°C
Current Supply Characteristics	PWM (See Graph)
Rated Current Range 12 VDC Coil	200-1500 mAmps
Coil Terminations	Deutsch DTO4

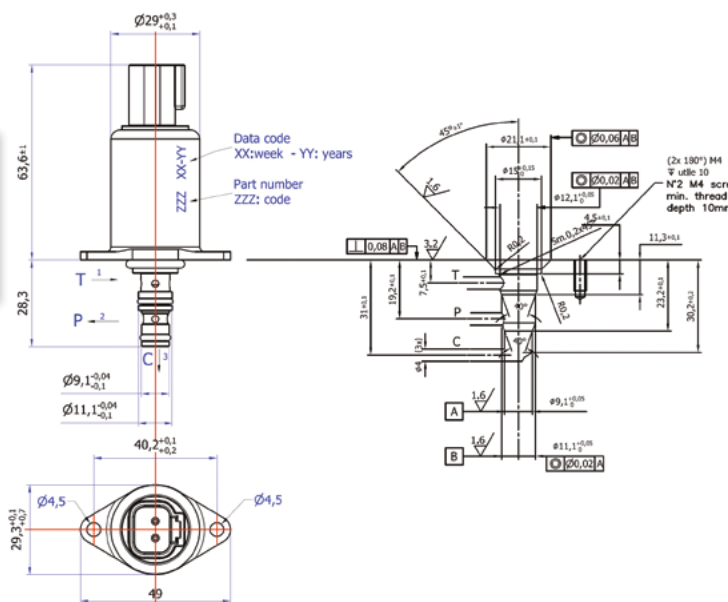
Performance curves



Hydraulic Schematic



29mm OD



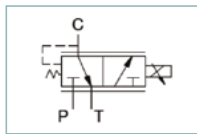
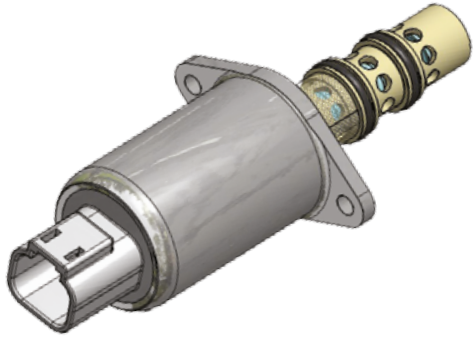
MOD. IP-RDS-T216/T222

Hydraulic Specifications

Configuration	Direct acting w/Step bore
Max. Input Pressure	60 bar
Max. Output Flow	30 lt/min @ 4 bar Delta-P
Control Pressure Range	See Graph
Typical Internal Leakage at Rest	15 cc/min
Max. Back Pressure at T Port	25 bar (Std)
Media Operating Temp. Range	-30°C / +115°C
Oil Viscosity Range	3 cSt / 647 cSt
Max Contamination Level	18/15 (ISO 4406)
Cavity Tool	TCN T216

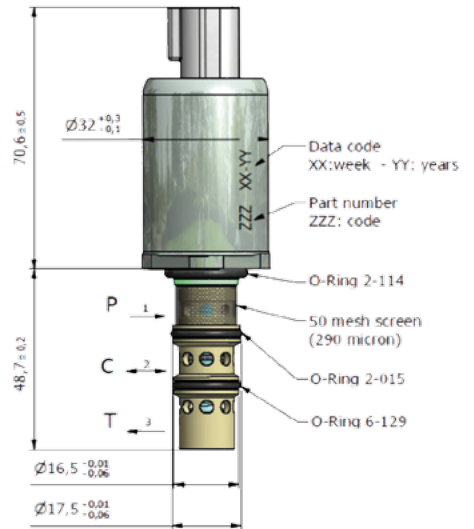
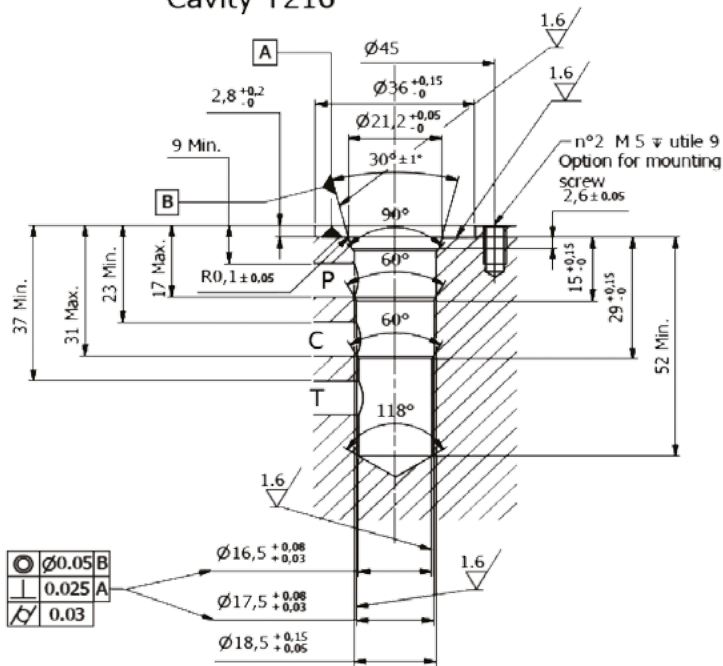
Electrical Specifications

Coil Resistance	5.2 Ohm (12 VDC)
	12.8 Ohm (24 VDC)
Current Supply Characteristics	PWM (See Graph)
Superimposed Dither Frequency	100 / 150 Hz
Coil Terminations	Deutsch DT04
Environmental Protection Rating	IP69K
Duty Cycle	100% EDI

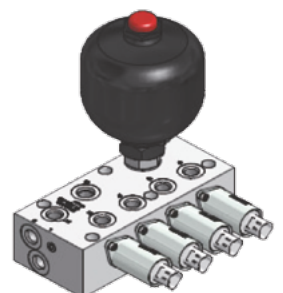
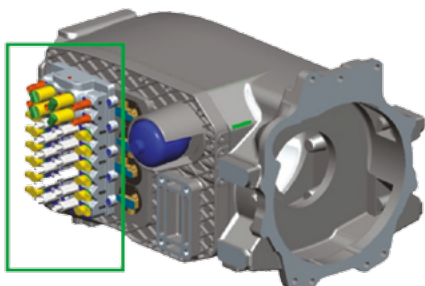
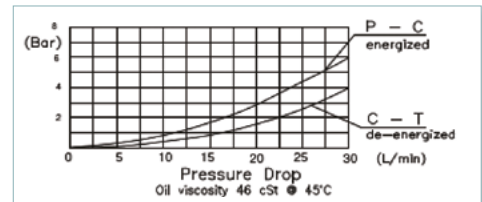
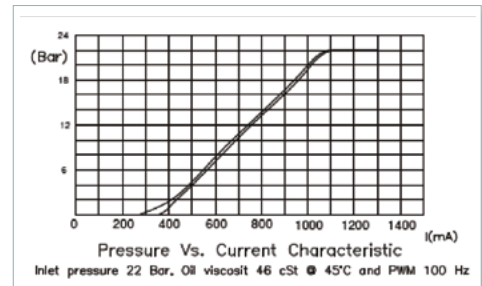


Hydraulic Schematic

Cavity T216



Pressure (bar) vs. Current (mA) Characteristic



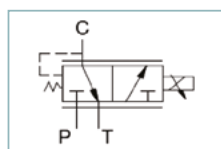
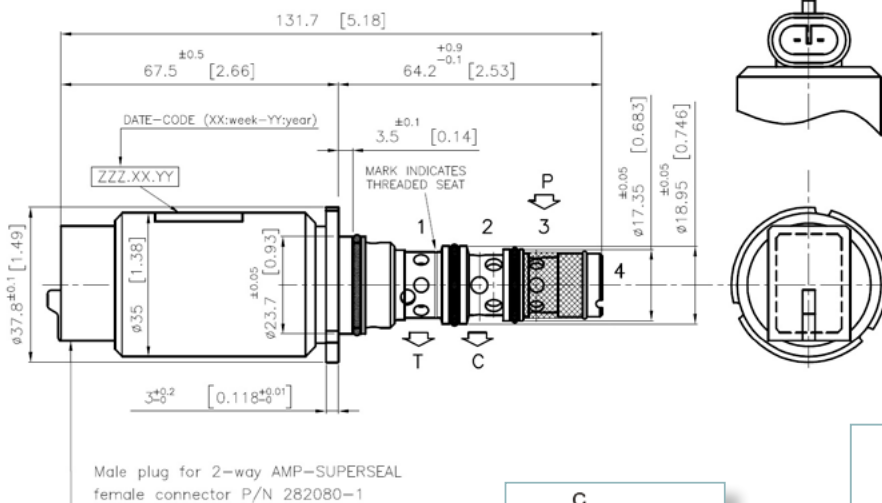
MOD. IP-PRZ-59

Hydraulic Specifications

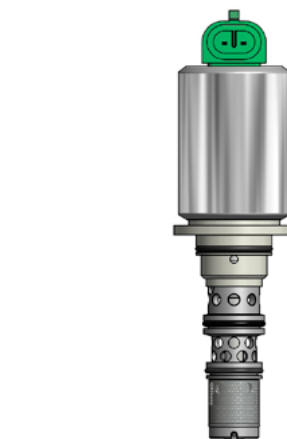
Configuration	Pilot Operated
Max. Input Pressure	50 bar
Max. Output Flow	40 lt/min @ 4 bar Delta-P
Control Pressure Range	See Graph
Typical Internal Leakage at Rest	450 cc/min
Max. Back Pressure at T Port	25 bar (Std) / 350 bar (Opt)
Media Operating Temp. Range	-30°C / +115°C
Oil Viscosity Range	3 cSt / 647 cSt
Max Contamination Level	18/15 (ISO 4406)
Cavity Tool	TCN T059

Electrical Specifications

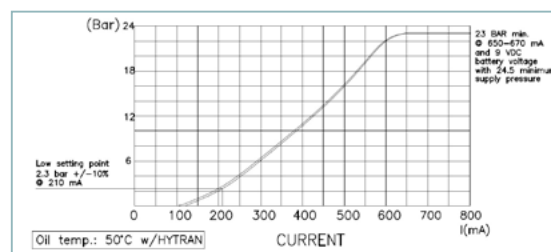
Coil Resistance	9.9 Ohm (12 VDC)
Current Supply Characteristics	PWM (See Graph)
Superimposed Dither Frequency	120 Hz \pm 15%
Coil Terminations	Packard MP150 (Amp Superseal Compatible)
Environmental Protection Rating	IP69K
Duty Cycle	100% EDI



Hydraulic Schematic

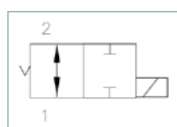
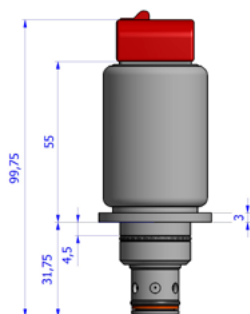


Pressure (bar) vs. Current (mA) Characteristic



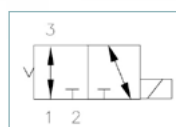
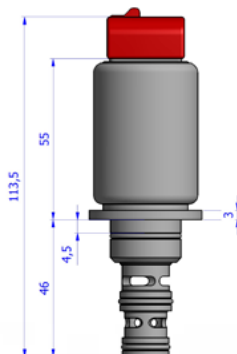
HIGH RANGE ON-OFF Directional Control Valves

MOD. IE-S2H-T056



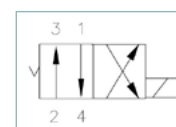
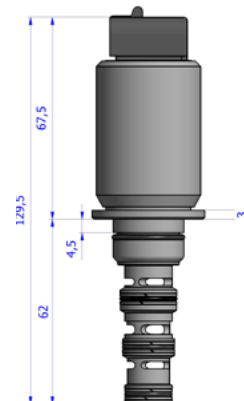
2way-2pos

MOD. IF-S3A-T057



3way-2pos

MOD. IG-S4A-T058



4way-2pos / Criss-Cross

Configuration	MINI SERIES Slip-in Negating Rod	STD CAVITY Slip-in Direct acting	MID-RANGE Slip-in Step bore	HIGH-RANGE Slip-in Pilot Operated
Pressure Control Range	0-30 bar	0-30 bar (std) / 0-45 bar (opt) 0-60 bar (opt)	0-30 bar (std) / 0-45 bar (opt) 0-60 bar (opt)	0-30 bar
Nominal Flow Rate (Press Drop <4 bar)	4 lt/min	6 lt/min	30 lt/min	35 lt/min
Leakage at rest	15 cc/min	15 cc/min	15 cc/min	450 cc/min
PWM Current Control Range @ 12 VDC	300-1400 mA (PWM)	300-1400 mA	300-1200 mA	100-750 mA
Ohmic Resistance @ 12 VDC	5.4 Ohm	3.2 Ohm	5.5 Ohm	9.9 Ohm
Coil Termination	Amp Junior Timer Deutsch DTO4	Amp Micro Quadlock	Amp Junior Timer Deutsch DTO4	Packard Metripack MP 150

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JD DF5000 TRANSMISSION



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