■ pumps DELTA dimensions in mm

setting screw of maximum flow

control device

bleed orifice G 1/4"

direction of rotation

M8

minimum flow pin (optional extra)
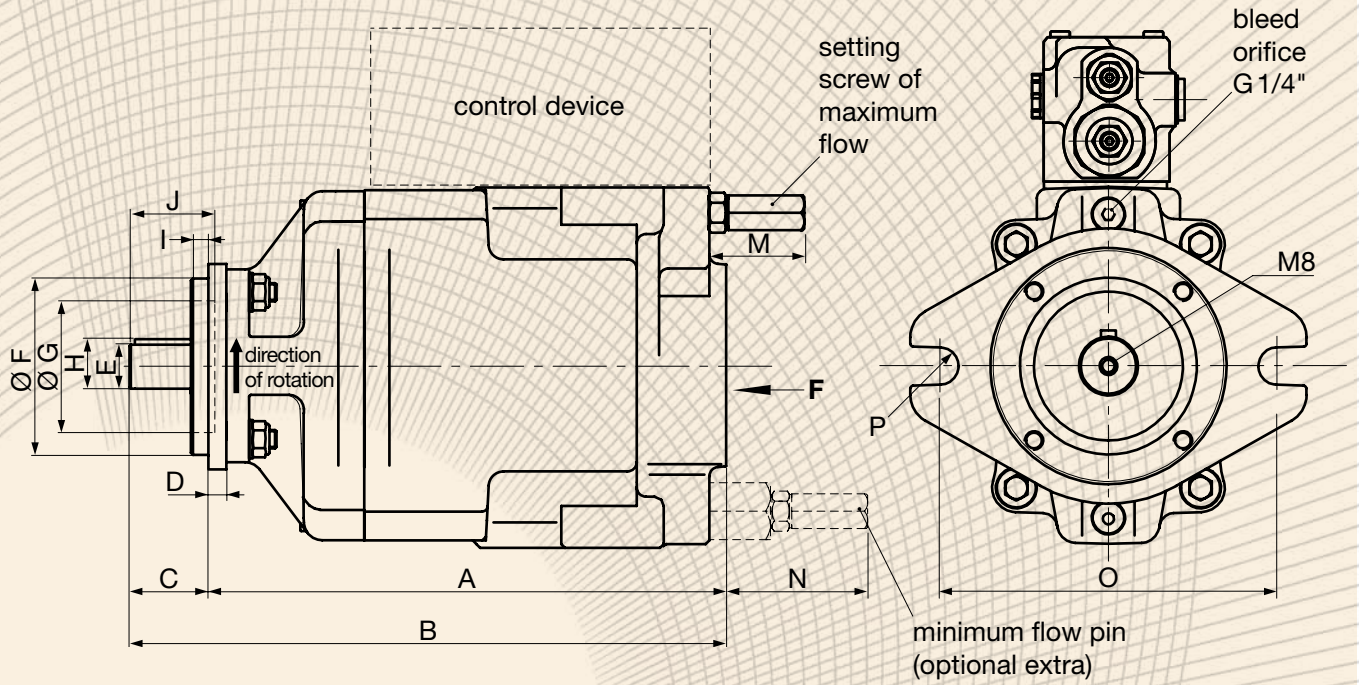
| pump	dimensions (mm)													
	A	B	C	D	ØE	ØF	ØG	H	I	J	M	N	O	P
DELTA 40	282	329	47	10	25.4 h9	101.6 h8	80	28.1 JS13 (bey width 6.38h9)	9.5	46	62	97	146	R8
DELTA 60 to 92	282	339.1	57.1	13	31.75 h8	127 h7	95	35.2 JS13 (bey width 8e9)	12.7	58.4	62	97	181	R10

For other shafts, please contact our Technical Department.

■ connection dimensions in mm (other port styles available)

view from F

view from F

36.1 · 29 · 15 · 19

G1"1/2 inlet

G3/4" outlet pressure

CW

CCW
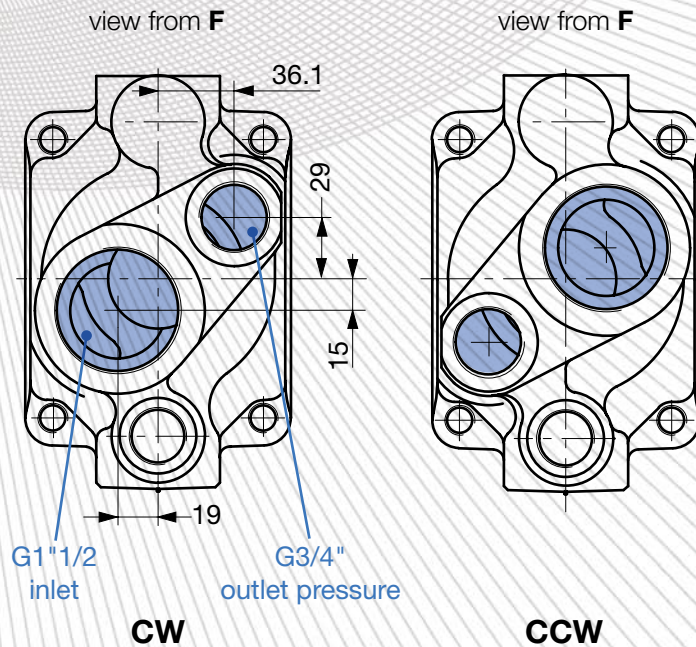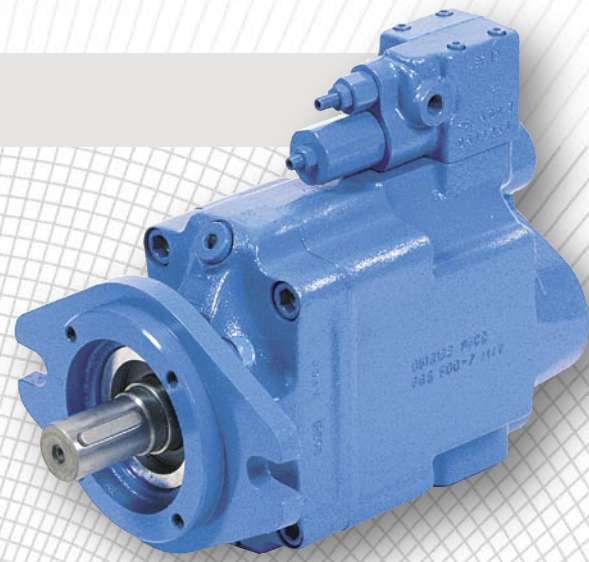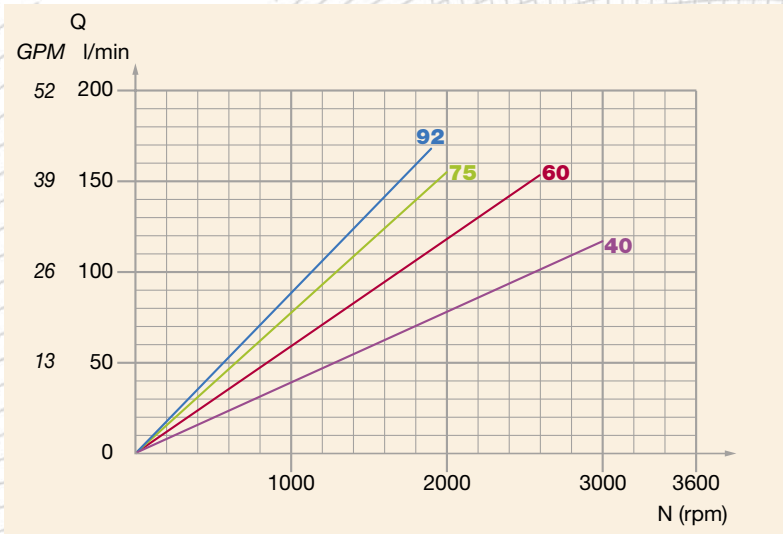
■ flow

Graph of flow as a function of speed and displacement of the pump.
These graphs are the results of tests carried out by the HYDRO LEDUC Research Laboratory, on a specific test bench, with ISO 46 fluid at 25°C (100 cSt), a 1" diameter supply line 5 ft long, and a tank with oil level at the same height as the pump.

■ required torque at maximum displacement
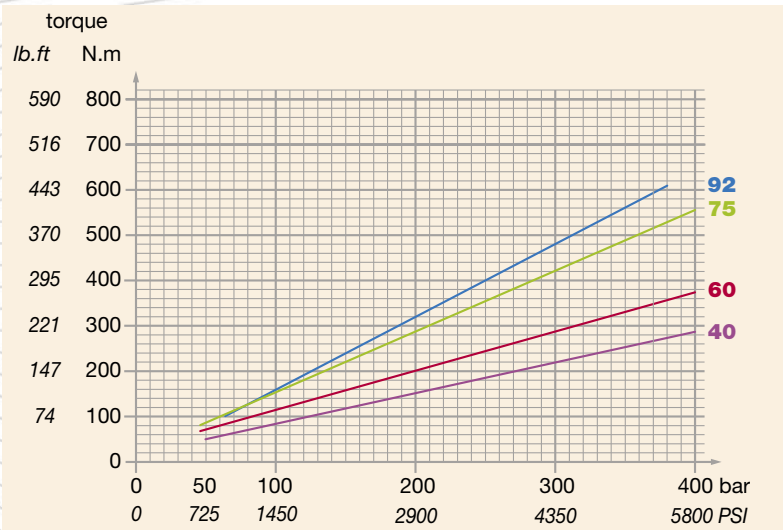
calculating power as a function of torque

$$C = \frac{P\ (kW)}{\omega} \times 100 = m.daN$$

$$\omega = \frac{\pi N}{30}$$
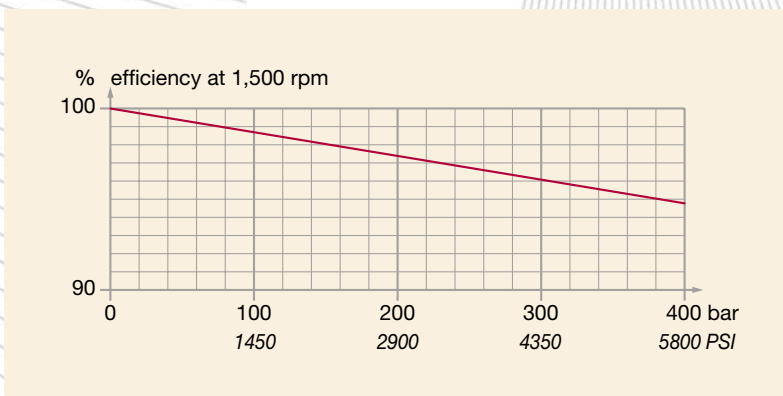
$$P\ (kW) = \frac{\Delta P \times Q}{600}$$

(theoretical hydraulic power) where:
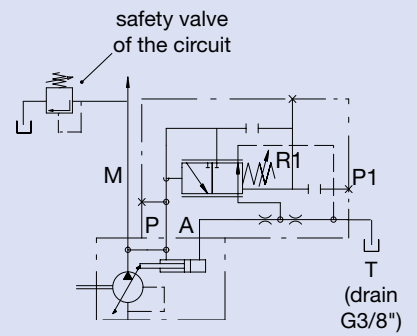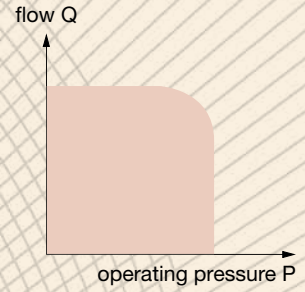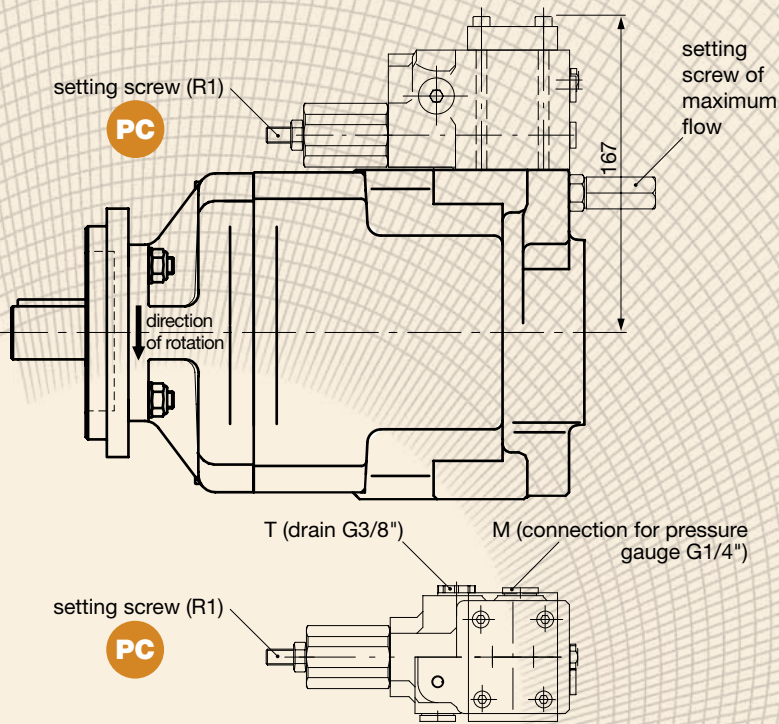N = speed in rpm
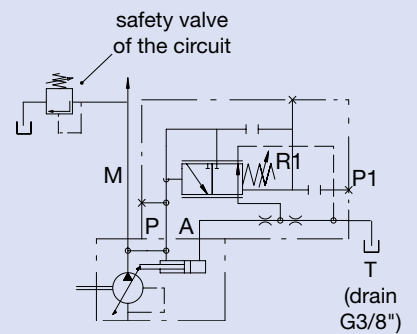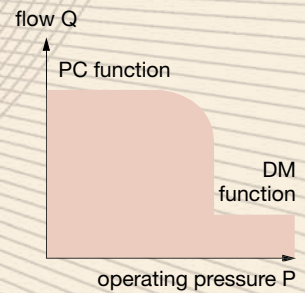ΔP = working pressure in bar
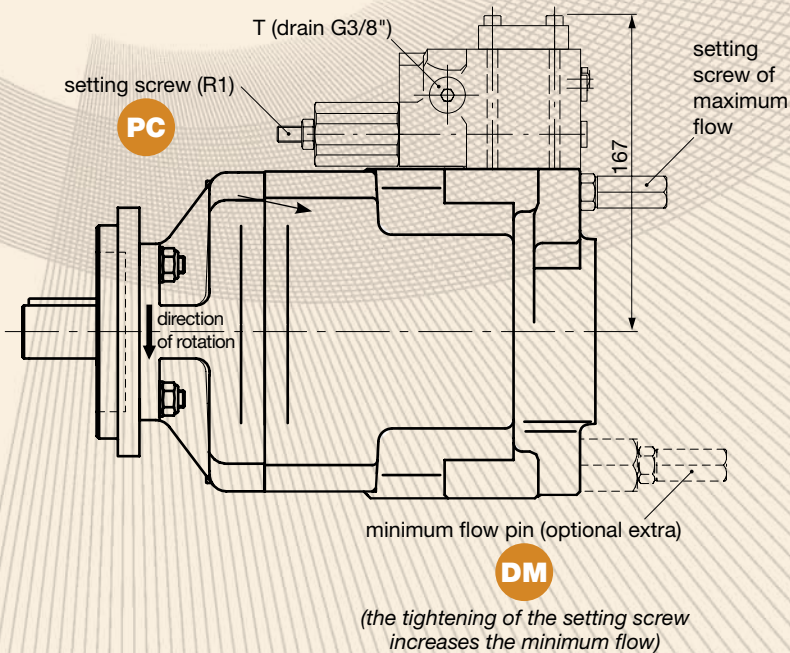Q = flow in l/minute

■ volumetric efficiency

Viscosity 100 cSt,
inlet at air pressure.

5

PC - constant pressure

setting screw (R1)
PC

setting screw of maximum flow

167

direction of rotation

T (drain G3/8")

M (connection for pressure gauge G1/4")

setting screw (R1)
PC

flow Q

operating pressure P

safety valve of the circuit

M

R1

P

A

P1

T (drain G3/8")

PCDM - constant pressure with minimum flow control

T (drain G3/8")

setting screw (R1)
PC

setting screw of maximum flow

167

direction of rotation

minimum flow pin (optional extra)

DM

(the tightening of the setting screw increases the minimum flow)

flow Q

PC function

DM function

operating pressure P

safety valve of the circuit

M

R1

P

A

P1

T (drain G3/8")

control devices

PCD - remote control constant pressure

P (G1/4" outlet for PCD)

setting screw of maximum flow

187

direction of rotation

T (drain G3/8") M (connection for pressure gauge G1/4")
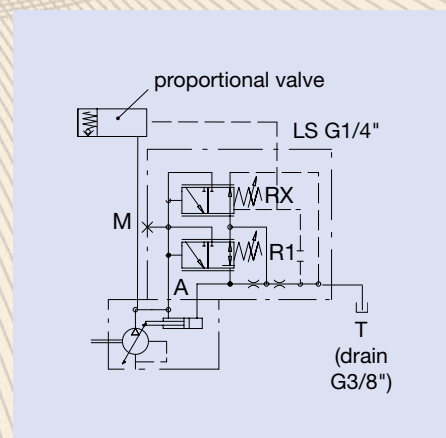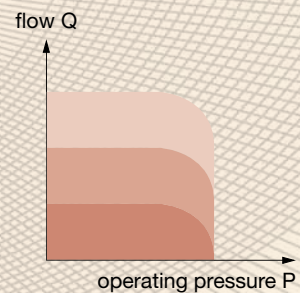
stand-by setting (RX)

flow Q

operating pressure P

safety valve of the circuit

LS

M

RX P1

not supplied

P A

T (drain G3/8")

PCD setting

7

LS - flow-pressure regulation

stand-by setting RX *(set at the factory to: 30 bar; can be set at up to 40 bar; please contact us)*

cancellation pressure R1 setting (maximum 400 bar)

setting screw of maximum flow

167

direction of rotation

T (drain G3/8") M (connection for pressure gauge G1/4")

LS G1/4"

flow Q

operating pressure P

proportional valve

LS G1/4"

M

RX

R1

A

T (drain G3/8")

LSD - remote control
flow-pressure regulation

P (G1/4" outlet for PCD)

setting
screw of
maximum
flow

187

sens de
rotation

T (drain G3/8")   M (connection for pressure
gauge G1/4")

stand-by setting (RX)

LS G1/4"

flow Q

operating pressure P
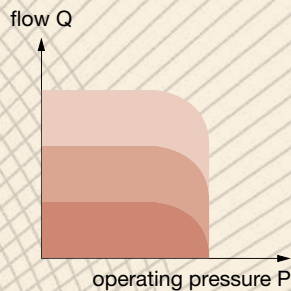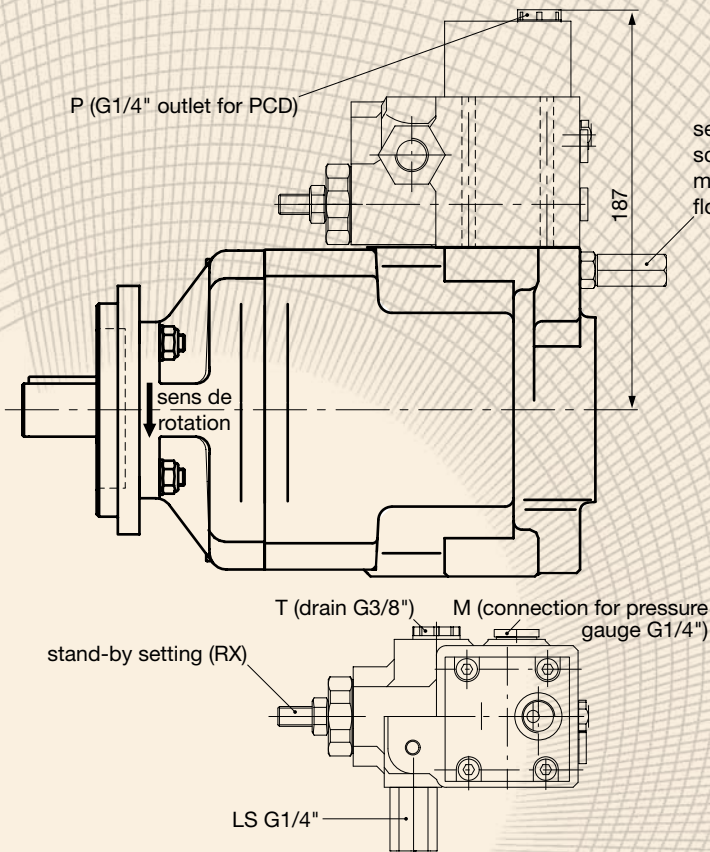
*Example: safety valve at 330 bar,
PCD: 300 bar.*

proportional valve

LS G1/4"

P1 (connexion G1/4")

not
supplied

M

RX

P   A

T
(drain
G3/8")

PCD setting

8
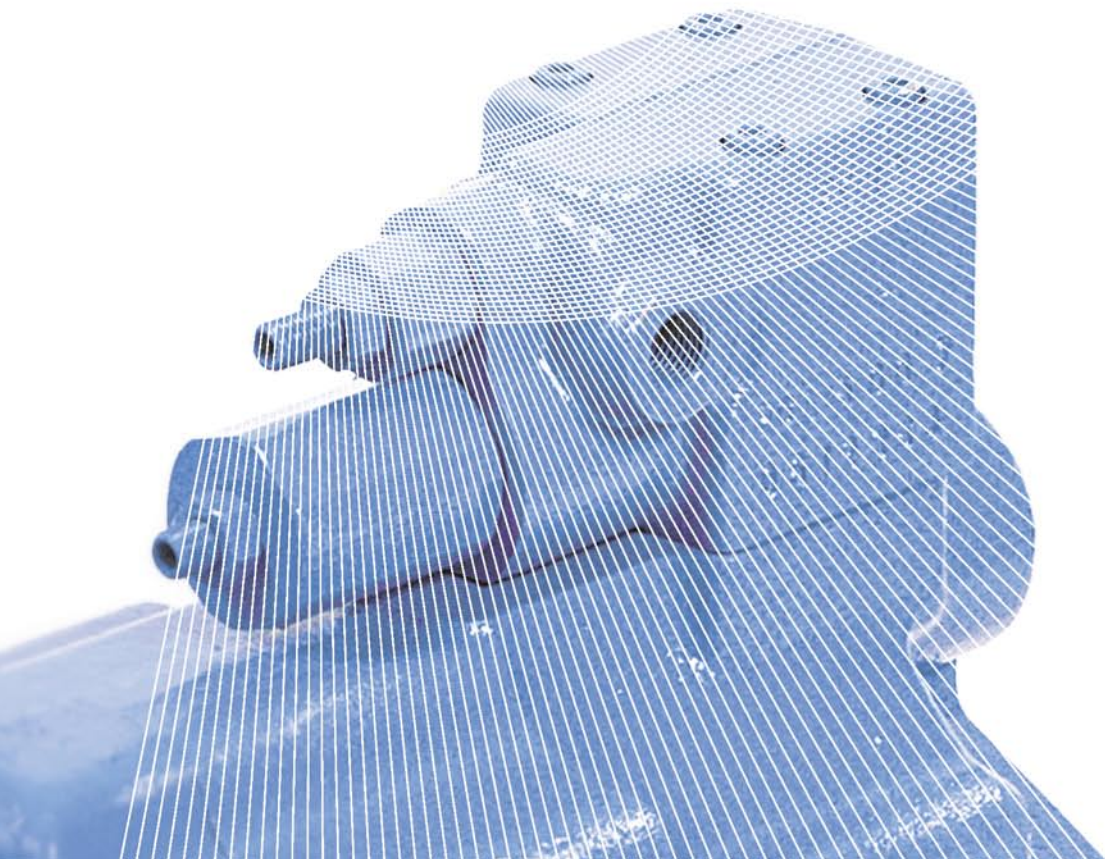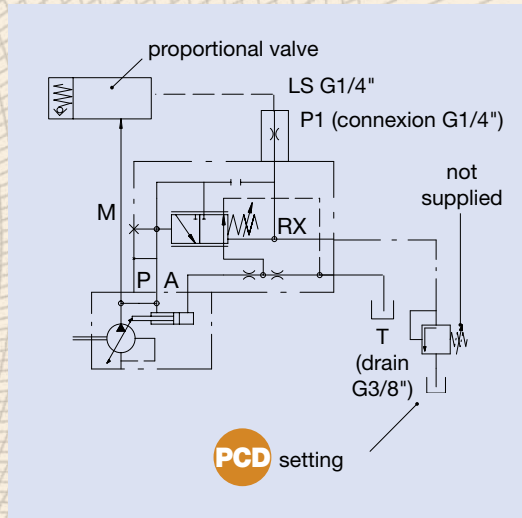
■ constant pressure: PC

The pressure control maintains constant pressure in the hydraulic system.

As soon as pressure reaches the level set on the control, the flow of the pump automatically regulates itself according to what the application requires. This minimizes system heat and energy for those applications requiring pressure to be held constant.

Examples:
• hydraulic press,
• compression mold,
• manufacturing of composites…

■ remote control constant pressure: PCD

This allows to control the pressure setting according to the requirements of the different devices within the circuit.

Examples:
• control of a cylinder under maximum pressure of 300 bar,
• control of a hydraulic motor at 200 bar.

■ constant pressure with minimum flow control: PCDM

(can also be remote PCD-DM)

This is used in every case where the reduction of the main flow must still allow the flow of a separate device.

## ■ flow–pressure control (LS: Load-Sensing)

This control device (LS) enables the flow and the maximum output pressure of the pump to be controlled continuously.

From this, it is easy to imagine all possible combinations:
• large flow and small pressure,
• high pressure and small flow.

This type of control can be fitted with remote control to control pressure and flow.

■ principle of pressure control
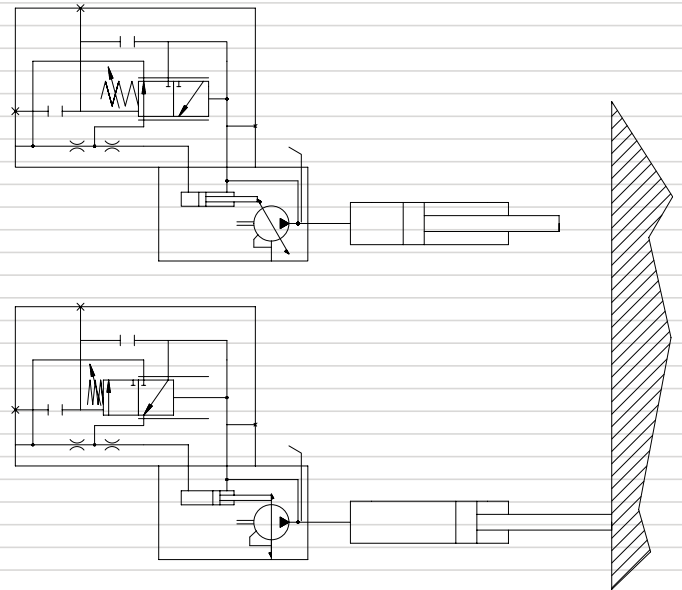
■ principle of flow-pressure control

The flow of the pump **Q** through the application **E** must ensure a constant ΔP set at 20 to 30 bar. This ΔP is proportional to:
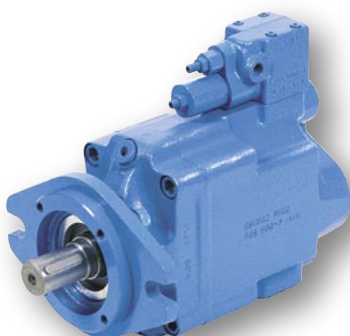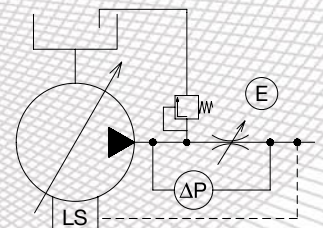
$$\frac{Q2}{S2} \qquad \text{so } \Delta P = f\left(\frac{Q2}{S2}\right)$$

Each time the ΔP varies due to a change at **E**, the pump will vary its flow **Q** to suit and to ensure:

ΔP = constant.

E can be:
- a flow control,
- a proportional valve,
- a simple restriction device.

Important note!
unless otherwise specified by customer, **constant pressure is set at 1450 PSI** (100 bar)**, stand-by is set at 435 PSI** (30 bar)

9

■ inlet

Recommended inlet pressure: up to 4 bar maximum. Accepted negative pressure: 0.2 bar maximum.

■ output

Pumps capable of 400 bar with pressure peaks up to 420 bar.

■ drainage

Maximum pressure of 0.5 bar above the inlet pressure of the pump.

■ fluid

Mineral based hydraulic fluid (for other fluids, please contact us). Recommended viscosity: from 15 to 400 cSt.
Minimum viscosity: 10 cSt. Maximum viscosity: not to exceed 1000 cSt.

■ filtration

The good operation of DELTA pumps depends on the cleanliness quality of fluid. HYDRO LEDUC recommends: class 9
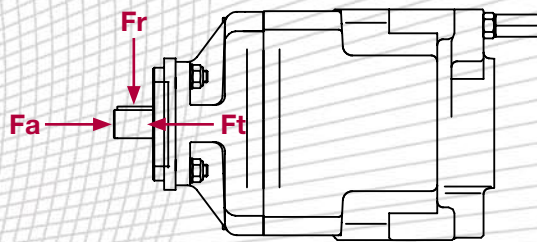according to NAS 1638, class 6 according to SAE or 18/15 to ISO/DIS standard 4406.

■ force on pump shaft

Fr: maximum acceptable force = 675 lbf (3000 N),
Ft: acceptable force = 340 lbf (1500 N),
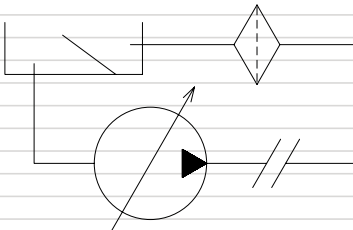**Fa:** acceptable force = 23 lbf/bar (100 N/bar)*.
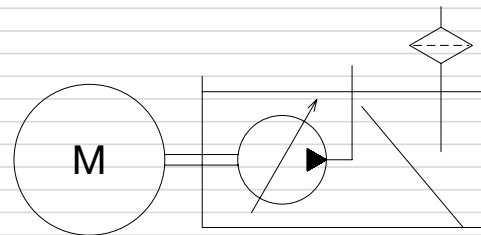*output pressure in the pump.*

10

■ mounting positions

Tank above pump (gravity-fed):
• inlet to guarantee an inlet speed of 3 ft/sec
  (1 m/s) if possible (6 ft/sec maximum),
• avoid pressure drop on inlet.

Pump submerged in oil:
• in every case, opt for filter
  on fluid return line.

The DELTA pumps are designed to operate any orientation.
However, the positions shown below are preferable.

■ optimization of the transmission of power to the shaft of the pump

gear drive

belt drive

CW   CCW   CW   CCW