

LINEFLO E VARIABLE SPEED CENTRIFUGAL PUMPS



GENERAL

Read this documentation in conjunction with LINEFLO operating and maintenance instructions.

Installation and operating procedures must comply with safety regulations in force in the country in which the product is installed. The entire operation must be carried out in a workmanlike manner by suitably qualified personnel.

Failure to comply with appropriate safety regulations and installation procedures can cause risk to personal safety, damage to equipment and invalidates the right to assistance under guarantee.



WARNINGS

SKILLED PERSONNEL

Installation and operation of the equipment must be carried out by suitably qualified skilled personnel, as defined in IEC364 for Technical personnel.

SPECIAL WARNINGS

Always switch off the mains voltage before working on the equipment.

WAIT AT LEAST FIVE MINUTES AFTER SWITCHING OFF THE POWER BEFORE OPENING THE EQUIPMENT. THE CAPACITOR IN THE CIRCUIT REMAINS CHARGED WITH A DANGEROUSLY HIGH VOLTAGE EVEN AFTER THE POWER HAS BEEN SWITCHED OFF.

MAINS TERMINALS (L1, L2 and L3/U, V and W) MAY CARRY DANGEROUS VOLTAGE EVEN WITH THE MOTOR STOPPED.

THE CONVERTER MAY RESTART AUTOMATICALLY AFTER A POWER CUT.



ELECTRICAL CONNECTIONS

Switch off the mains supply before connecting the power cables to the pump motor. Wire the equipment in accordance with the wiring diagram.

The Hydrodriver contains components with very sensitive semi-conductors which are particularly vulnerable to electrostatic charges. Avoid touching the conduction tracks or the components with your hands or with metal objects.

The control cables and mains cables must be laid separately.
A screened cable must be used for control cables.

OPERATION

The HYDRODRIVER regulates the pump speed whilst maintaining a constant differential head, as preset at the pump regulating knob. (Refer to pump curve)

Integral protection with automatic restart up to 5 times, includes, overload, lack of phase, excess temperature and high or low voltage.

The standard equipment facilities include, remote control terminals, economy function, duty pump alternation, terminals (without potential) for remote alarm reset, head regulation knob and indication LED's.

TROUBLE-SHOOTING

THE MOTOR DOES NOT START

Check the LED's (yellow - green)

GREEN LED	YELLOW LED	INVERTER STATUS	REMEDY
ON	ON	Mains voltage on, the converter is not working (standby).	Ensure that input control A is on.
FLASHING	FLASHING	Limit current alarm.	Check that impeller is free. Check motor bearings.
FLASHING	ON	Excess temperature in the converter (Internal PTC).	Check the ambient temperature. Check the ventilation.
OFF	FLASHING	Low mains supply voltage.	Check the supply voltage.
OFF	OFF	Fault in mains voltage.	Check the connection between power mains and Hydrodriver. Check switches and fuses.



MAINTENANCE

Keep the equipment clean and dry, normal operation does not require any routine maintenance.

Periodically check that the equipment is operating correctly.

Ensure that the duty pump is alternated at least monthly.


The equipment should not be dismantled, except by suitably skilled personnel.

HYDRODRIVER A 0.25 kW to 1.5 kW inclusive
FIG. 1

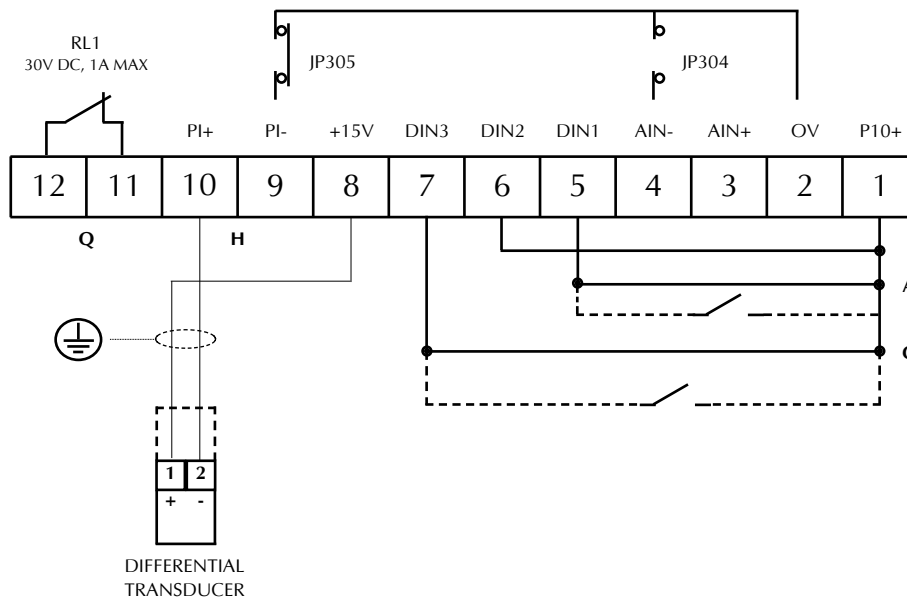
HYDRODRIVER B 2.2 kW to 7.5 kW inclusive
FIG. 2

L1 - L2 - L3 FOR THREE PHASE MOTORS.
L1 - N FOR SINGLE PHASE MOTORS.

SINGLE LINEFLO TE TERMINAL CONNECTIONS

REFERENCE	FUNCTION
L1-L2-L3 L - N	CAUTION ! - TERMINALS FOR POWER SUPPLY
	CAUTION ! - TERMINAL FOR EARTH
A, 1 - 5	TERMINALS FOR CONNECTING REMOTE CONTROL. (REF 10V dc 5mA)
C, 1 - 7	TERMINALS FOR CONNECTING ECONOMY FUNCTION. (REF 10V dc 5mA)
Q, 11 - 12	REMOTE ALARM. CONTACT WITHOUT POTENTIAL NC MAX 30V dc 1A
H, 9 - 10	PRESSURE TRANSDUCER INPUT 4 - 20mA
REGULATING KNOB AND LED'S (YELLOW - GREEN) SEE FIG'S 1 & 2	

SINGLE PUMP CONTROL WIRING DIAGRAM FIG. 4



No further equipment is necessary for the basic operation of the single pump Hydrodriver.

The converter does not have a mains switch, it is always live.

DIGITAL INPUT CONTROLS

--**Start-stop control (A)** - to switch on the control, remove link between terminals 1 - 5.

--**Economy function (C)** - to switch on the control, remove link between terminals 1 - 7.

SINGLE PUMP HEAD REGULATION


All the digital inputs (A - C) must be closed.

- 1 - Unscrew the cap from the regulating knob.
- 2 - Adjust the knob until the design head is obtained, referring to the pump curve.
- 3 - Replace cap to cover the regulating knob.

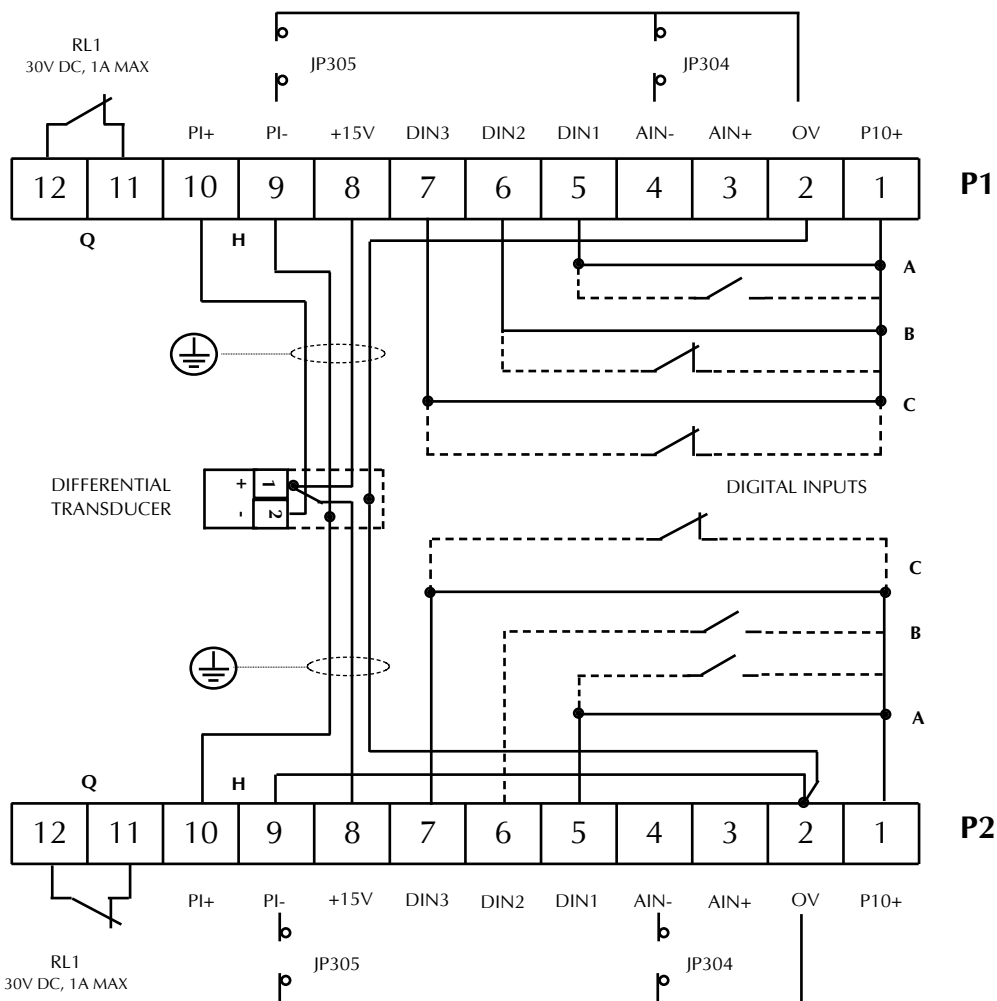
L1 - L2 - L3 FOR THREE PHASE MOTORS.
L1 - N FOR SINGLE PHASE MOTORS.

LINEFLO E VARIABLE SPEED CENTRIFUGAL PUMPS

TWIN LINEFLO DTE TERMINAL CONNECTIONS

REFERENCE	FUNCTION
L1-L2-L3 L - N	CAUTION ! - TERMINALS FOR POWER SUPPLY
	CAUTION ! - TERMINAL FOR EARTH
A, 1 - 5	TERMINALS FOR CONNECTING REMOTE CONTROL. (REF 10V dc 5mA)
B, 1 - 6	TERMINALS FOR ALTERNATING DUTY PUMP. (REF 10V dc 5mA)
C, 1 - 7	TERMINALS FOR CONNECTING ECONOMY FUNCTION. (REF 10V dc 5mA)
Q, 11 - 12	REMOTE ALARM. CONTACT WITHOUT POTENTIAL NC MAX 30V dc 1A
H, 9 - 10	PRESSURE TRANSDUCER INPUT 4 - 20mA
REGULATING KNOB AND LED'S (YELLOW - GREEN) SEE FIG'S 1 & 2	

TWIN PUMP CONTROL WIRING DIAGRAM FIG. 5



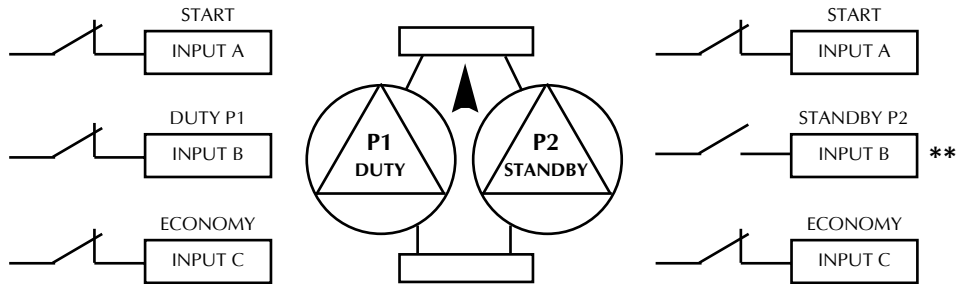
CAUTION! - IF ONE OF THE TWO PUMPS IS DISCONNECTED, TO KEEP THE OTHER ONE OPERATING ; ISOLATE THE CABLES ON TERMINALS 2 & 8 AND JOIN TOGETHER THE CABLES OF TERMINALS 9 & 10, ISOLATING THEM.

**L1 - L2 - L3 FOR THREE PHASE MOTORS.
L1 - N FOR SINGLE PHASE MOTORS.**

LINEFLO E VARIABLE SPEED CENTRIFUGAL PUMPS

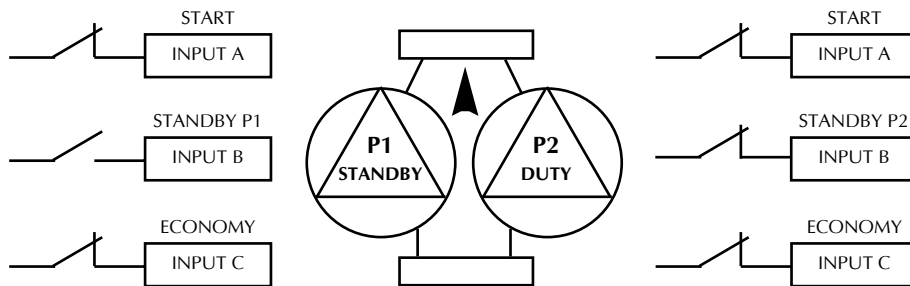
TWIN LINEFLO DTE - OPERATIONAL DIAGRAMS

STANDARD DUTY PUMP P1

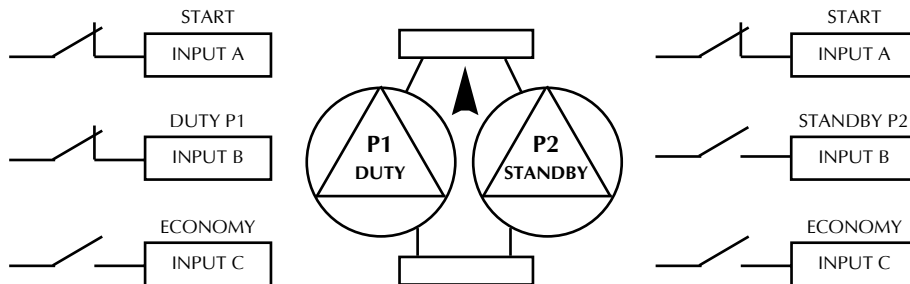


** TO REGULATE THE PRESSURE, CLOSE THE DIGITAL INPUT B OF PUMP P2

STANDARD DUTY PUMP P2



STANDARD DUTY PUMPS P1/P2 IN ECONOMY



NOTE ! - IN ECONOMY FUNCTION, A REDUCTION OF THE REGULATED HEAD, AMOUNTING TO 10% OF THE FULL SCALE VALUE, WILL BE ACHIEVED.

LINEFLO E VARIABLE SPEED CENTRIFUGAL PUMPS

No further equipment is necessary for the basic operation of the twin pump Hydrodriver.

The converter does not have a mains switch, it is always live.

DIGITAL INPUT CONTROLS

--**Start-stop control (A)** - to switch on the control, remove link between terminals 1 - 5.

--**Alternating operation of duty pump (B)** - to switch on control, remove link between terminals 1 - 6.

--**Economy function (C)** - to switch on the control, remove link between terminals 1 - 7.

TWIN PUMP HEAD REGULATION

Ensure that the Hydrodrivers are not live.

All the digital inputs (A - B - C) must be closed, for both pumps.

1 - Unscrew the caps from the regulating knobs.

2 - Adjust the knobs to **position 1**.

3 - Replace cap to cover the regulating knob.

4 - Supply power to **Pump 1 (P1)**

5 - Remove cap and adjust the regulating knob until the design head is obtained, referring to the pump curve.

6 - Replace cap to cover the regulating knob.

7 - Supply power to **Pump 2 (P2)**

8 - Adjust the regulating knob slowly clockwise until you cause an attempted start.

9 - Replace cap to cover the regulating knob.

10 - Interrupt the power supply to both pumps P1 and P2. Wait at least 5 minutes before opening the equipment.

11 - Open digital input B of pump P2.

12 - Restore power to the pumpset.

The pumpset will be ready to run with P1 as the duty pump and P2 as the standby.

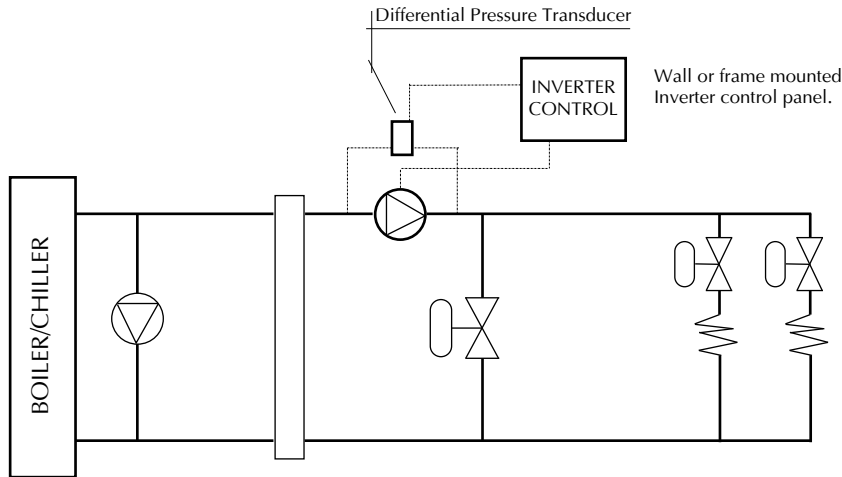
To check the operation, interrupt the power supply to pump P1, the standby P2 should start. If the standby P2 fails to start, repeat the operation described above.

Once tested OK, **restore the power to pump P1**, P1 will start and P2 will stop.

LINEFLO VARIABLE SPEED CENTRIFUGAL PUMPS

with Separate Inverter controller and dp transducer

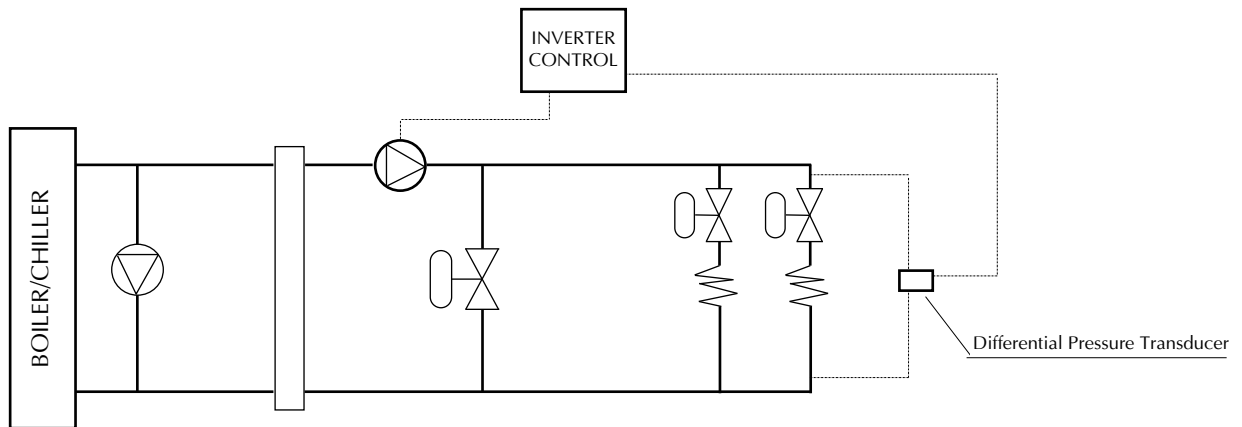
CONSTANT DIFFERENTIAL PUMP HEAD



In a typical system using 2-port valves, with the differential pressure transducer arranged about the main pump and set at the design system head, the pump will maintain a constant head against variable flow conditions by adjusting the pump speed. The absorbed energy will be reduced in accordance with the speed reduction.

TYPICAL ONLY ! NOT INTENDED TO COVER ANY PARTICULAR SYSTEM.

CONSTANT DIFFERENTIAL HEAD at INDEX CIRCUIT



In a typical system using 2-port valves, with the differential pressure transducer arranged about the index circuit and set at the minimum system head, the pump will follow the system head against variable flow conditions by adjusting the pump speed. The absorbed energy will be reduced in accordance with the speed reduction. This will result in a greater energy saving than the constant differential pump head system.