



## Hydro-pneumatic Multiple VFD Datasheet

### Standard Features :

- Dedicated external PLC. Speed variation by PID algorithm Touch screen, colour HMI.
- Maximum 4 Nos. of pumps in parallel operation. Can be increased if needed. User selectable working & stand by pump configuration.
- User selectable working and standby pump quantity.
- Lead as well as lag pumps alteration (Sequence of lag pumps). Auto take-over of standby pump in case of failure of working pump. Display of system parameters like set pressure, actual pressure.
- Display of pump parameters like on / off Status, current, KW,run hours.
- End of curve protection
- Low suction pressure protection. Points PLC ensures equal running of pumps No flow shut down.
- BAS/BMS connectivity via potential free contacts.



## **Sequence of operation:**

System includes minimum 1 pump to maximum 4 pumps in parallel operation. All pumps will be operated on variable speed using variable frequency drive. The expected pressure is set on controller. Controller senses discharge pressure through pressure transmitter.

Pressure transmitter gives the analog signal to controller. When system starts due to low pressure than cut in pressure, lead pump will start first and gradually increases the speed and achieves the set pressure. Controller compares actual pressure with set pressure and speed of the lead pump is varied according to requirement.

When demand increases further, lead pump is not able to achieve set pressure. When lead pump run at full speed for preset time & pressure is not achieved, then lag 1 pump starts on VFD. Both pumps will operate in parallel to achieve set pressure. If still demand increases, above cycle gets repeated.

When demand decreases, discharge pressure in the system will increase, which is sensed by the controller through pressure transmitter. Speed of the lead pump is reduced. If still discharge pressure is above set pressure, speed of lead pump is less than preset speed for preset time, lag pump gets switched OFF. Lead pump take care of reduced flow. When further demand decreases, the discharge pressure will increase and subsequently speed of the lead pump is reduced and in turn lead pump will also switched off and system remains in sleep mode. When demand is creates in system, discharge pressure will drop which will be sensed by the controller. Lead pump gets switched ON, gradually increases speed and achieves the set



pressure. Thus starts the second cycle. Controller ensures the equal running of all the pumps. If any working pump fails (Motor trip), system runs with remaining pumps which are selected as working.

## **Mode of operation:**

Variable Speed Pumping system can be operated in following mode:

- I) Manual mode
- II) Auto mode
  - a) Local operation
  - b) Remote operation

Selector switch is provided on panel door for Local / Remote mode selection. Also selector switch is provided on panel door for selection of auto / manual mode operation.

I) Manual mode – Pump/s can be operated manually. For manual operation start/stop push buttons are provided on panel door. Speed will be varied using potentiometer.

II) Auto mode – In this mode pumps are operated automatically in accordance controller (PLC) either in local mode or in remote mode.

The start command in manual mode or auto mode is given by operating push buttons or selector switches provided on panel door.

a) Auto operation in local mode – The start command is given through auto/manual selector switch which is provided on door of control panel. Local / remote selector switch should be in local mode.

b) Auto operation in remote mode – Remotely start command is through hardwiring potential free contact. Local / remote selector



switch should be in remote mode and auto / manual selector switch should be in auto mode.

## Control panel specification:

- **Panel Mounting** - Floor/ Wall as per panel size
- **Panel Material** - MS CRCA sheet steel
- **Painting** - Epoxy powder coated Structured paint
- **Colour Shade** - Siemens Grey RAL 7032 equivalent
- **Protection class** - IP42/IP54/IP55/IP64
- **Door Access** - Front Door Access
- **Cable Entry** - Bottom Cable Entry
- **Incomer** - Main common incomer ON/OFF type switch
- **Drive Isolation** - Individual isolator MCB
- **Fuse Protection** - HRC GG fuse links with fuse bases for input side of VFD
- **Electrical Protection-** Single phase, Reverse Phase, Under/OverVoltage
- **Indication Lamps** - Incoming Supply R, Y, B Drive Run, Drive Trip
- **Selector switches** - Auto/ Manual mode, Local/Remote
- **Control Supply** - Single phase control transformer
- **VFD** - Per pump one VFD



The system maintains the pressure close to the set point with the help of PLC & VFD's & avoids

- Flow Surges
- End Of Curve
- Over Pressure
- Low Suction Pressure

