

## **ADMIXTURE DOSING SYSTEM with FRT303-MES20NE**

Congratulations on choosing a **ManuFlo**®™ Dosing Indication control system. You will now join many satisfied customers worldwide.

### Your system comprises:

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### Information sheets included:

1. FRT303 Indicator specification datasheet
2. FRT303 Operating / Installation Manual.
3. MES20NE or MES20 datasheet
4. Calibration / Program commissioning sheet.

### Prior to installation:

- A. Consider a good viewing and operating position for the FRT303 Indicator Output device. The unit is a wall mount design so mount via the two (2) outer lugs on the enclosure. Allow easy access to remove the cover via the 4 screws. Lift away carefully as it is connected to the top PCB display via ribbon cable.  
*WARNING: If the FRT303 is installed outside then install a sun shield/cover over the unit.*
- B. Allow easy access to the cable gland entries on the enclosure in order to run the signal cable from the MES20 flowmeter and if installed any output signals namely the pulse and 4-20mA. Detach the green mating plugs and connect the wires to the designated terminals. Connect to the 240VAC supply (or DC powered as optionally ordered). Refer to wiring diagram found in the FRT303 manual.
- C. Install the flowmeter as per the installation guide.  
Use shielded cable only for connection between flowmeter and Indicator (upto 250meters) .  
Note: The FRT303 powers the MES flowmeters with +9vdc.
- E. The FRT303 indicator, is pre-programmed/calibrated for use with MES20 20mm flowmeters at 1000pulses/liter. The other engineering units are setup to the default operating ranges of the MES20. To re-program the display readout and output values refer to the FRT operating manual and re-program via the push buttons.  
A volume collection calibration check of fluid must be performed during commissioning and prior to continuous use of the system (see installation guide).
- F. The FRT303 can be used in manual form & simply open or close the flow restriction valve, the indicators FLOWRATE display readings will respond accordingly. Or the system can be totally controlled via a PLC/computer via the pulse and mA outputs or proportional solenoid control valve if installed.

If unsure on any aspect of installation or operation, contact ManuFlo or your local installer

**ManuFlo**®™  
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ManuFlo recommends all non-manuflo supplied equipment be sourced locally if possible (e.g. Valves, hoses, solenoids, pipe fittings etc).

**ADMIXTURE SYSTEM INSTALL PROCEDURE**


- Mount the pumps on the stand with the flowmeters and fittings. Wire as per wiring diagrams.
- Protect all external 240vac power cables with channel conduit to protect from electrocution).
- Run the low voltage +9-12vdc signal cable from the flowmeters to the FRT303 indicator.
- Make sure the flowmeter cable gland entry is tightened, the lid is fitted and the Junction-cover cap is in place
- Make the cable is looped downwards to prevent dripping water ingress.
- 



**Select a pump that matches and meets the desired flowrates expected.**

PUMP SELECTION					
Order Code	Size	Type	Description	Power	Watts
ONGA413	1"	Onga 413	Single phase centrifugal pump 0.5hp, < 50LPM @12m/H	240vac	400
SJ35-04	1"	Davey SJ35-04	<ul style="list-style-type: none"> <li>• Single phase centrifugal pump. 45 Litres/min. @10m/H</li> <li>• IP55 motor. 2900 rpm. 2.3 Amps..</li> </ul>	240vac	370

Other suggested pump options:- Onga 400 (CF) 413-417 series centrifuge pump series.  
 Positive Displacement Pump options:  
 Mono Pumps 240vac CP25 @30LPM, CP800 @80LPM, CP1600 @120LPM. I/O 1 to 1 1/2" BSP-f  
 Onga Pumps 240vac JS110 @45LPM, JS120 @ 90LPM, I/O 1" to 1 1/4" BSP-f threaded connections.  
 Stats@10mtrs/H. Self-priming to 6 metres up to 25 metres head. (specs.with water)  
**Ideal for higher S.G chemicals and faster flow delivery requirements.**



Davey SJ-35 Series Pumps – ideal for low cost delivery of water-based admixtures

- built to cover a wide range of applications. suitable for pumping clean non-aggressive liquids without solids or fibres in suspension. Strong durable.
- manufactured from molded materials giving superior resistance to corrosion. SS304
- Efficient design produces greater flow whilst maintaining low power consumption. Maximum working pressure : 410 kPa, Liquid temp. range 1 – 50 °C
- Max. Ambient temp. 55 °C. Motor: TEFC 2 Pole Continuously rated.
- Nominal speed: 2900 rpm, IP rating: IP55

**USE RE-INFORCED HOSE LINES for Admixture installs.**

**General Pump application use info:**  
 Centrifuge (CF) Pumps general use for typical chemical admixtures.  
 Positive Displacement (PD) Pumps ideal for dispensing higher S.G. liquids Delivering faster flowrates and head heights. These pumps generate higher pressures so ManuFlo recommends a recirculation pressure relief flow line be installed. Refer to our technical guides.

Signal Cable:		
Qty	Model	Description
1	WS3028	Signal Cable Heavy Duty 100 mtr roll <ul style="list-style-type: none"> <li>• 2-core wire braid screen shielded -</li> <li>• AWG24</li> </ul>

3 Way Valve		
Qty	Model	Description
1	WS3028	SRS Pro Reduced bore 3 way valve <ul style="list-style-type: none"> <li>• 3 x 5/8" threaded connections</li> <li>• brass construction</li> <li>• to provide isolation for decanting and calibration.</li> </ul>

Install a three-way valve if wishing redirect liquid flow to collect a volumetric sample for a calibration check.

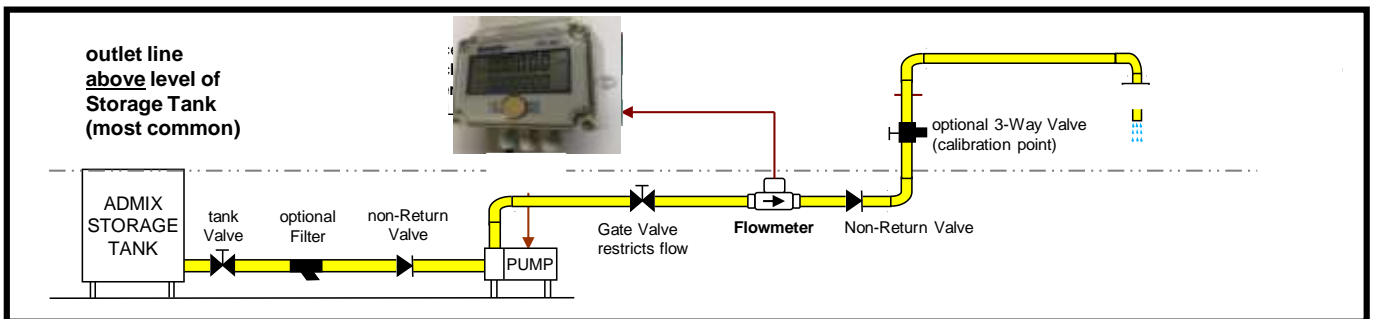
# INSTALLATION GUIDE with MES20 and other flowmeters

- (1) Locate the most appropriate position to mount the MES20 flowmeter. Preferably:
- your site's flowmeters should be grouped together off the ground on a stand.
  - protect the flowmeters from the elements by using a cover, which should be lightweight with handles for easy access by service personnel.
  - a vibration free area is recommended, for the original MES20 as is sensitive to high vibrations which can cause some stray pulses. For Newer MES20 and MES20N there is less requirement as incorporate latest technology digital vibration free sensors. (see the "Installation" section in the MES product brochure).

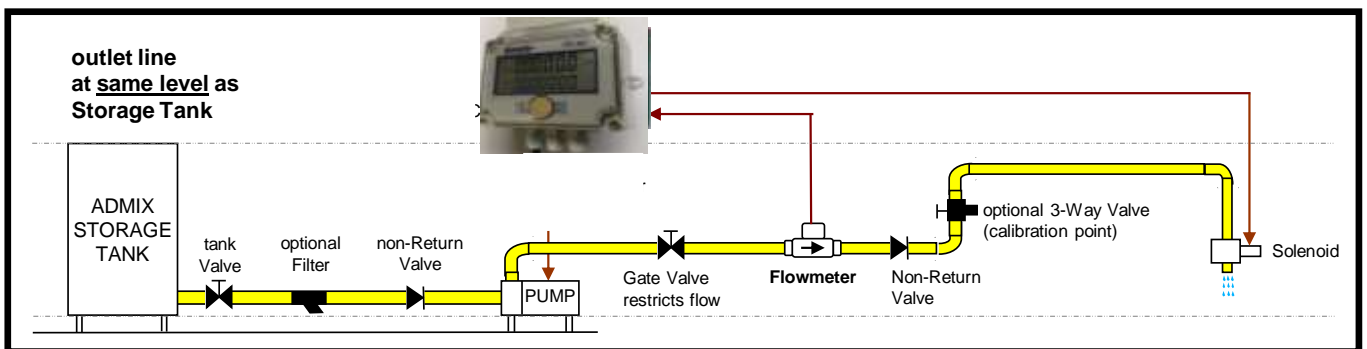
(2) Establish the outlet point position in relation to the storage tank:

**2a) If the outlet point is above the top of the storage tank (the most commonly used setup),** then the additional equipment you will need is at least: a pump, non-return valves or spring loaded check valves (12psi), flow restriction gate or ball valve and, optionally:

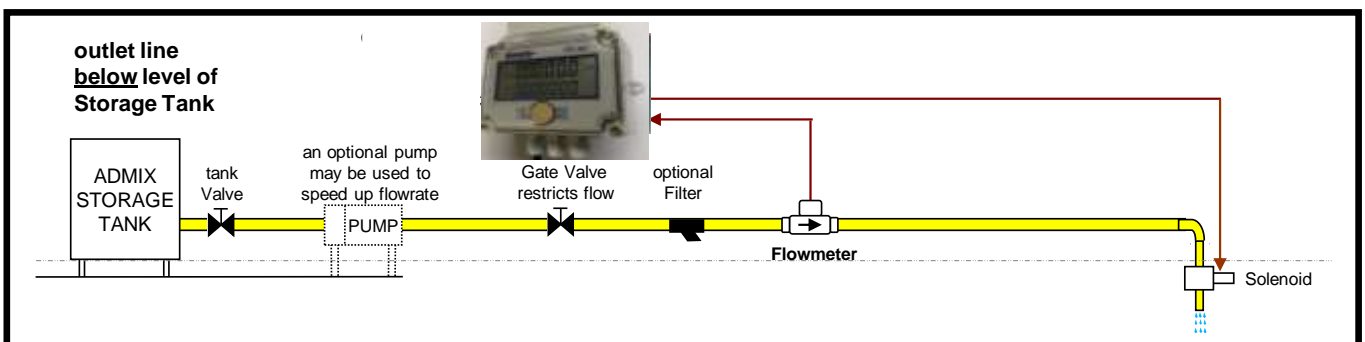
- a solenoid valve (air-assisted ball valve type) for instant shut off of flow, recommended to prevent the Venturi effect when injecting into water lines, but may not be required if the installation has reasonable head height.
- a 3-Way Valve to provide an easily accessible calibration point.
- 3/4" to 1" pipeline or rigid hose.



**2b) If the outlet point is at the same level as the storage tank,** then the equipment you will need is at least: a pump, a flow restriction gate or ball valve, a flowmeter with pulse output, and a solenoid valve to stop free flow.



**2c) If the outlet point is below the level of the storage tank,** then the equipment you will need is at least: a flow control solenoid valve, a flow restriction gate or ball valve, and a flowmeter with pulse output.



## SELECTION OF PIPE LINE DIAMETERS (for MES20 20mm flowmeters)

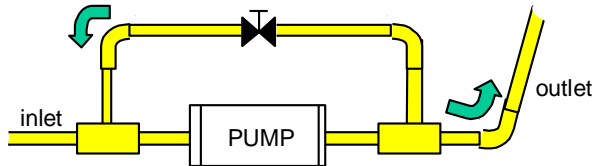
► For low flowrates and small batch quantities of liquid (approx < 2000mls), use ½" diameter pipe or hose (after the flowmeter). ► For medium to high flowrates, use ¾" to 1" diameter pipe. ► For very high flowrates, use 1¼".

NOTE: Pipeline can be flexible reinforced hose (NOT flexible expandable soft hose), rigid PVC or metallic.

**Warning: Running flowmeters over their maximum flow rating will damage them and may cause overdosing., so make sure to select the larger size 25, 32, 40mm MES flowmeters and hose line diameters to match your requirements.**

## PUMP SELECTION

► When 20mm MES20 flowmeters are used with fluids of specific gravity 1 - 1.25, then use centrifuge pumps of 0.5 - 1 horse power (e.g. 1" Onga 413 or Davey pumps. When using larger capacity flowmeters, a proportionally larger pump will apply). A flowrate upto 0.8 Litres per second can be achieved, depending on head height. ► For higher density fluids, positive displacement (PD) pumps are more suitable. Because of pressures generated by PD pumps, it is important to be able to restrict the flow – this can be achieved by using an inlet-to-outlet bypass flow valve to recirculate the flow line.



**Note:** This method of restriction of flow eliminates air being counted by MES flowmeters if the admix storage tank is empty.

## FILTERS

Although MES flowmeters can pass small solids without jamming, a considerable amount of foreign particles can be transferred into admix storage tanks. Therefore, it is advisable to install a box filter prior to positive displacement type flowmeters, to prevent possible blockage to the flowmeter measuring chamber unit (Amiad™ Ystrainer 800-micron filter is recommended).

## COMMISSIONING BATCH CONTROL SYSTEMS

- Determine the most appropriate position to mount the Indicator so it will be clearly visible to the operator and within easy reach.
- Electricians must refer to the relevant ManuFlo wiring diagram. Ensure that there is no power to the FRT303 before connecting the flowmeter signal cable into the plug. When wiring the flowmeter, use 2-core shielded cable (use more cores if wiring more flowmeters) - this will supply the flowmeter(s) with 12VDC from the Batch Controller, and will transmit pulses from the flowmeter to the Batch Controller: 1 wire for pulse, 1 wire for +12 volts, and the shield as 0 volts return (For 2-wire contact closure flowmeters and electromagnetic flowmeters, do not use 12 volts).
- Connect the applicable power supply voltage to the controller(s). For pump applications, a heavy duty contactor (10 Amps for e.g. Onga413 centrifuge pump) must be wired into the system. Contactors can be supplied by ManuFlo. Do not use plug-in relays.
- Power up the system. Prime the system, until fluid appears at the outlet line and the FRT303 digits begin counting.

**A volumetric calibration test should be performed when commissioning a new installation: place a calibrated vessel at the discharge point, collect a visible volume and cross reference with the FRT303 LCD resettable total display. THEY MUST MATCH WITHIN THE +/-1.5% accuracy of the flowmeter.**

**If the amount is greater then check the Calibration input setting program on the FRT303 > CAL:03 K-FACTOR. Refer to the manual for detail. But simply if the volumetric amount collected is more than the displayed amount on FRT then decrease the CAL-setting by the same percentage difference. (& the inverse applies).**

**A calibration check should also be performed periodically (say every 3-6 months):**



If unsure about any aspect of installation, please check the appropriate wiring diagram, product brochure manuals

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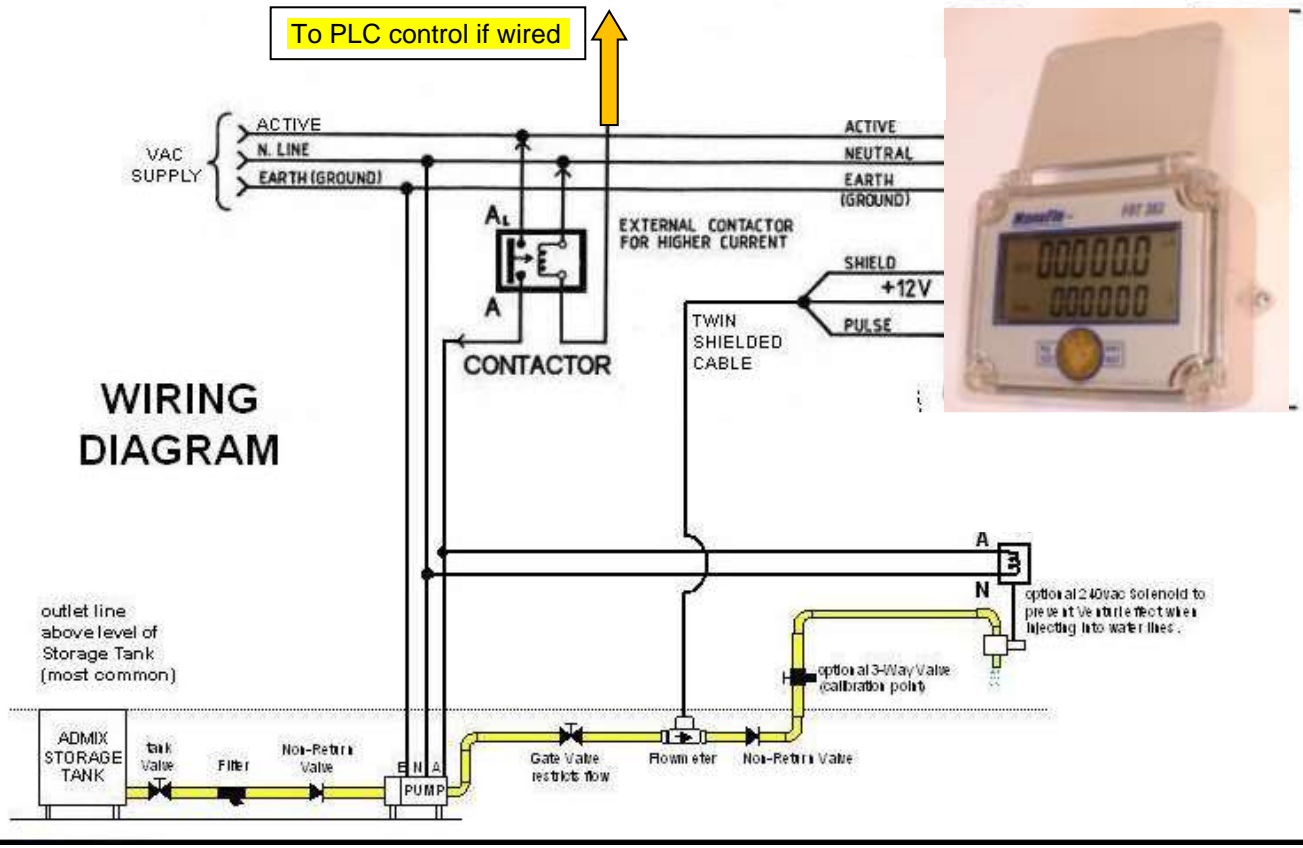
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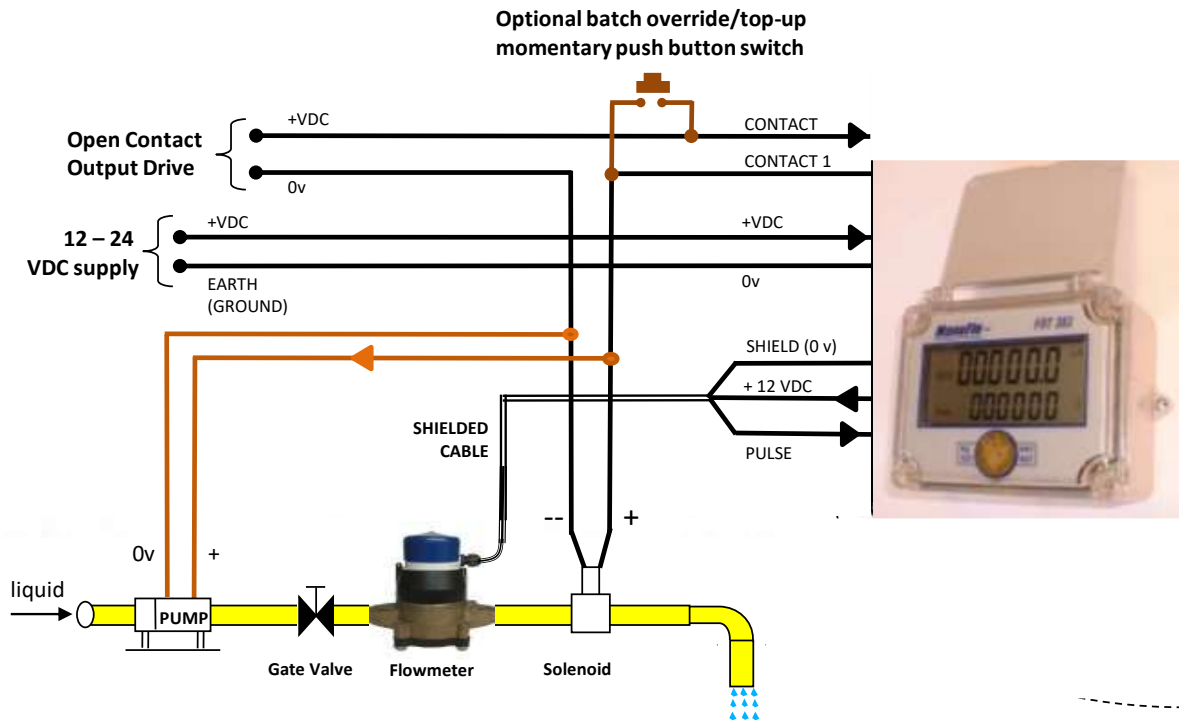
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**Standard AC Wiring for Pump and optional Solenoid**



**Wiring for DC-powered**