

SELECT Dosing System

Select-640



Instructions for Use

Ref: 20.3 IFU 640 Feb '09
640-053

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Single tube possibility for all ratios
Multiple languages
Heavy duty motor and gearbox

640 Denotes changes / improvements compared with Select-480 doser



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Quick-fit Instructions

 <p>Install flow sensor in water line. Ensure arrow marked on sensor corresponds to direction of flow.</p>	 <p>Assemble the T-piece and reducer.</p>	 <p>Install after the flow sensor.</p>	 <p>Insert female coupling into reducer. This is the point of product injection.</p>	
 <p>Unpack the 3m delivery tube.</p>	 <p>Cut to convenient lengths for doser to product container, and doser to injection point.</p>	 <p>Fit the male injection piece into the end of the delivery tube going to the water line.</p>	 <p>Remove the 3 screws holding the pump cover in place and remove cover.</p>	
640	 <p>Using the tube connectors provided, connect the pump tube as shown.</p>	 <p>Place the tube restraint (black zip tie) in the left hand (IN) side restraint of the pump-head as shown. Select "Load tube? Yes" from the screen controls.</p>	 <p>With the rotor pulse turning, feed in the pump tube so that it lies horizontally in the pump-head and fully into the tube guides. CARE – MIND YOUR FINGERS</p>	 <p>Replace the pump cover and the 3 screws. The tube can be primed using the on-screen controls once the cover is re-fitted.</p>
 <p>To fit the non-return valve, cut the delivery tube on the OUT side of the pump.</p>	 <p>Push-fit the non-return valve ensuring correct direction of flow by blowing through the valve</p>	 <p>Finish connecting the delivery tube as shown.</p>	 <p>Connect the flow sensor plug along with the electric power supply.</p>	

Description

The Select-640 dosing system is a proportional additive pump designed to incorporate medications, vaccines, nutritional products acidifiers, and sanitisers into the drinking water of domestic livestock. The components are: the main pump unit, a water flow sensor, and connections to the drinking lines. There are no user serviceable parts inside the Select-640 doser.

Changing Pump Tubes

ENSURE EITHER THE POWER SUPPLY OR FLOW SENSOR LINE IS DISCONNECTED BEFORE CHANGING THE PUMP TUBE.
OTHERWISE ROTOR TURNING IS POSSIBLE

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Removal of pump tube – Remove the black pump cover (3 screws). Unclip the pump tube at the inlet. Lift out the pump tube whilst rotating the pump rotor by hand in a clockwise direction (or use Load Tube facility). When the pump tube is clear of the rotors, completely remove the tube. Pull the old (soft) pump tube from the tube connectors.

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Push the new pump tube onto the tube connectors WITH THE BLACK TUBE RESTRAINT (CABLE TIE) ON THE INLET SIDE. See instructions on Page 2 to install new tube in the pump-head.

Ensure that all connectors between the pump tube and delivery tubes are securely fitted. If necessary warm the delivery tube with warm air or water to soften it to make fitting more easy.

Pump Tube Life

The life of the pump tube will depend on many factors including the product being dosed, the back pressures under which the pump is working, and the amount of time the pump needs to run to perform correctly. It is suggested that, in order to maintain dosing accuracy, the pump tube is replaced on a BI-MONTHLY BASIS or sooner if wear or disfiguration of the tube is apparent. Spare tubes are available from your pump supplier. Note: Only tubes supplied by Dosing Solutions Ltd are recommended for use in the Select-640 dosing system to ensure accuracy of operation. Tube-Burst sensors are now fitted as standard on the Select-640 (Jan '09).

Safety

The Select-640 doser is an extremely safe unit. However, the following points should be observed:

Normal electrical safety precautions apply. Avoid water contact with any pump parts apart from the pump tube in normal working. Do not immerse the Select-640 doser in water.

Take precautions to ensure the Select-640 doser can not fall into the stock solution. Consider extra tethering if necessary. Cover stock solution at all times. If immersion does happen accidentally, isolate the Select-640 Doser from the electrical supply immediately.

The use of safety circuit breakers is recommended. If in doubt seek advice from a qualified electrician.

Accuracy

The Select-640 doser is factory set to give accurate dosing. If, during normal operation, the output needs to be increased or decreased slightly, this can be achieved via the screen command "Adjust %".

Electrical Supply

The Select-640 doser uses a 12V DC power supply. This can either be supplied from a 12V battery or via a transformer power supply from the mains electricity supply. A 3.8A maximum current power supply is recommended. The Select-640 doser normally runs below 2A although starting currents are larger and dependant on the pumping conditions encountered.

The Water Flow Sensor

The standard water flow sensor (VTY10) records water flow from 20 litres/hour to 1500 litres/hour. Over 500 electrical pulses are sent from the sensor to the Select-640 doser per litre of water flow. The standard VTY10 sensor will withstand pressures up to 6 Bar. Ensure that the flow sensor is installed in the water line up-stream of the point at which the Select-640 doser injects the additive into the drinking line. Water flow should be in the direction of the arrow on the sensor.

Several flow sensors can be pre-installed in different drinking lines along with connection points for the additive delivery tube. Lines can then be individually medicated.

Operation

When the electric supply is first connected, the version of the programming will be shown.

<p>This is the Welcome Screen To see the options available press "Set" (Options) To start dosing immediately, press "Adjust (Start)</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Select</p> <p>Start Options</p> </div>
<p>If the "Options" button is pressed, the first option is to choose if the doser will continue to dose in a situation when the water flow is out of range (too high). Press Adjust until Y (yes) or N (No) is shown. With Y the doser will run constantly at high water flow. With N the doser will stop dosing and return to the welcome screen at high water flow.</p> <p>Press Set with the correct Y or N shown.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Doser options</p> <p>Cont at Hi Flo Y</p> </div>
<p>Where tube fracture alarm option is fitted, press Adjust to Select either Y to enable (activate) the tube burst function, or N to cancel it. If the tube burst device is not fitted, you must Select "N".</p> <p>Then press Set.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Doser options</p> <p>Tube Burst En. Y</p> </div>
<p>The third option is the selection of operating language. Press Adjust repeatedly until the desired language is shown. Then press Set to return to the Welcome Screen</p> <p>At the Welcome Screen press Start</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Doser options</p> <p>Lang. English</p> </div>
<p>IF ONLY WATER METERING (NO DOSING) IS DESIRED</p> <p>Press Adjust (Meter)</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Select</p> <p>Meter Dose</p> </div>
<p>Press Adjust repeatedly until the correct flow sensor number (the one to be connected to the doser) is shown. Not all flow sensors will be offered</p> <p>Then press Set.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Sensor Type</p> <p>3</p> </div>
<p>The Select-640 doser is also a water meter. If you wish to reduce the water total to zero, press Set. If you wish to keep the water total already recorded, press Adjust.</p> <p>The water total is updated each 5 minutes. Short recording times may lose a small amount of water data.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Zero water tot?</p> <p>No Yes</p> </div>
<p>This is the metering screen. The flow rate of water is 4,740 litres per hour, Sensor 3 has been selected, and the total on the water meter is 108 litres.</p> <p>Press and hold the Adjust button for a short time to exit this screen.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Meter only 4740H</p> <p>00000108T S3</p> </div>

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<p>TO DOSE PRODUCT USING THE SELECT-640 DOSER</p> <p>Press Set (Dose) to start the dosing process.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Select</p> <p>Meter Dose</p> </div>
<p>First choose the flow sensor that is to be connected to the doser (it will be written on a tag attached to the sensor plug).</p> <p>Then press Set</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Sensor Type?</p> <p>3</p> </div>
<p>By pressing Adjust repeatedly the available ratios are shown. When the desired ratio is shown, press Set</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Ratio 1:?</p> <p>1K</p> </div>
<p>Ratio of 1:1000 will be shown as on this screen where K is the abbreviation for thousand. 12K5 is 1:12,500, 20K is 1:20,000</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Ratio 1:?</p> <p>12K5</p> </div>
<p>Once the desired ratio has been Select-640ed, the correct tube to fit is displayed. Fit the correct colour pump tube as described in Changing Pump Tube above and the Quick-fit Instructions on Page 2.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>1:50</p> <p>Use tube: Purple</p> </div>
<p>Pump tubes may be slightly too large or too small after manufacture. The correction for this is shown as % Adjust on the packet that the tube was supplied in. Press Adjust to scroll from -20% to +20% until the correct tube adjust is shown. Then press Set.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Adjust %</p> <p>-5%</p> </div>
<p>The Select-640 doser is also a water meter. If you wish to reduce the water total to zero, press Set. If you wish to keep the water total already recorded, press Adjust.</p> <p>The water total is updated each 5 minutes. Short recording times may lose a small amount of water data.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Zero water tot?</p> <p>No Yes</p> </div>
<p>640 To load a new tube in the pump-head, press Yes to start the rotor pulse turning to assist in the loading procedure. See Quick-fit Instructions on Page 2 for details.</p>	<div style="border: 1px solid black; padding: 10px; text-align: center;"> <p>Load tube?</p> <p>No Yes</p> </div>
<p>640 Once the tube is loaded and level, press Stop.</p>	

	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 150px;"> Loading... Stop </div>
In order to fill up the delivery tube with the product to be dosed, press Set (Yes). The pump will run constantly to fill the delivery tube. Press No if tube filling is not required.	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 150px;"> Prime pump? No Yes </div>
This screen will be shown while the pump is running to fill the delivery tube. Press Stop once the tube is full up to the injection assembly.	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 150px;"> Priming... Stop </div>
For the first few seconds, this screen will be shown. The doser is collecting water flow information before dosing commences.	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 150px;"> 1K Ppl -5 0H Dosing... S3 </div>
This is the normal dosing screen. A ratio of 1:1000 has been Select-640, the water flow rate is 420 litres per hour, the water meter is showing a total of 106 litres, and Sensor 3 has been chosen.	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 150px;"> 1K Ppl -5 420H 00000106T S3 </div>
If the water flow is too high for the doser to be able to dose correctly, this screen is shown each 5 seconds alternating with the normal dosing screen to show the water total. If "Cont at Hi Flo?" is set at Yes (in Options), the doser will run continuously, but will return to normal dosing when the water flow reduces to a manageable level. Press Adjust for a short time to return to the Welcome Screen and clear the "High Flow!" message.	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 150px;"> 1K Ppl -5 1420H High Flow! S3 </div>
If Tube Fracture detection kit is fitted, and if moisture connects the two gold pins, this message will be shown on-screen and the doser will stop dosing. Press OK to return to the Welcome Screen.	<div style="border: 1px solid black; padding: 5px; margin: 0 auto; width: 150px;"> Tube fractured! OK </div>

To make any adjustments to settings, return to the Welcome Screen and progress through the options. To return to the Welcome Screen, press and hold **Adjust** from the Operational Screen.

On the Operational Screen, the following colour abbreviations are used for pump tubes:

Grey	GRY
Purple	Ppl

Water Meter Total and Zero

Note: the maximum quantity of water that is shown on the water total quantity is 100,000,000 litres. After this the meter will return to zero, and water metering will re-commence as normal.

640 The water total can be returned to zero at any time from the dosing screen by pressing "Set" and holding for 3 seconds.

Flow Sensor Capacities

There is a maximum limit on the flow of water permissible through each flow sensor. The maximum flows are:

TBR 10 (Sensor 1)	400 l/hr
VTY 10 (Sensor 2)	1,500 l/hr
VTH 25 (Sensor 3)	10,000 l/hr

VTH 40 (Sensor 5)

25,000 l/hr

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Proportional Dosing

A feature of the Select-640 doser is that, due to upgraded software, a single pump tube can be used for all dosing ratios.

The dosing ratios in each Select-640 doser are specified by the code number either on the smaller of the two computer chips on the PCB inside the doser, or on the label on the side of the doser.

During proportional dosing, the Select-640 doser constantly monitors the water flow in the drinking line. Each 5 seconds the doser injects exactly the right amount of additive into the drinking line or tank according to the ratio of administration selected.

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When water flows are low, it is possible that the rotor may not turn in one or more of the 5 second periods. In this state, the doser will store accumulated flow information until it is possible to make a minimum turn of the pump rollers.

Complete mixing of additive into the drinking water is achieved by turbulent flow in pipe-work.

Maximum Water Flows for Each Dosing Ratio

The maximum water flow for any ratio is: $36 \times \text{ratio}$

...where 36 is the maximum pumped output of the pump in litres per hour with the purple tube fitted. E.g. with a dosing ratio of 1:200, the maximum water flow that can be dosed is $36 \times 200 = 7,200$ l/hr.

If the Select-640 doser is turning for almost the full 5 seconds of each 5 second dosing period, this is the maximum output of the pump. If the water flow is exceeded then "High Flow" will be shown on-screen.

Note: The actual maximum water flow allowable will be the lower value of the calculation above, or the sensor flow capacity shown above (Flow Sensor Capacities).

Alarms and Warnings

If a high water situation is detected where the doser is unable to keep pace, the doser will either continue to dose and display "High Water Flow" on-screen (If the "Cont.at Hi. Flo? Option is answered Yes under Options) or a warning will be shown on-screen and the doser will stop operation (If the "Cont.at Hi. Flo? Option is answered No under Options).

If for some reason the rotor becomes jammed or there is a mechanical fault within the pump drive system a warning – "Pump Error" may appear on-screen. If the fault is not immediately apparent and rectifiable, PLEASE CONTACT YOUR DISTRIBUTOR.

Water Line Pressure

The Select-640 doser will operate against a water pressure in the drinking line of up to 2 bar. (2 bar = 28psi = 66ft H₂O = 20.4m H₂O). Fit a pressure reduction device if necessary. The flow sensor is rated to 6 bar.

Constant Pumping

If the priming option is selected from the menu on the control screen (see above) the pump rotor will turn continuously regardless of the flow in the drinking line. This can be useful for filling the suction and delivery lines prior to proportional dosing. It can also be used if a particular product needs to be dosed quickly within a given period. The following pumping rates will be achieved when the Select-640 doser is set to "prime":

Pump Tube Colour	Priming pump rate	Note:
Grey	72 litres / hour	Used for low pressure metering
Purple	36 litres / hour	Normal proportional dosing tube

It is not recommended to use the Select-640 doser for more than 2 hours at a time in the priming mode, as tube and motor life will be reduced.

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Rotor Adjustment

The rotors in the Select-640 pump-head are not adjustable.

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Encoding

Under the rotor assembly, there is a magnet holder plate that turns with the rotor on the drive shaft. This plate should be fitted so that the magnets are facing upwards.

There is a nylon washer under the magnet holder plate.

Installation

The Select-640 doser can be powered from a 12V DC battery or via a transformer from the mains electricity supply. Position the dosing point on the drinking lines so as to be convenient for a power source if power is to be taken via a transformer from the mains. Ensure that the Select-640 doser is properly secured to prevent it becoming immersed in water or stock additive solution.

The flow sensor is fitted with standard fittings which will need to be adapted to fit into existing pipework. Use PTFE tape as necessary to ensure leak-free fitting. Avoid undue strain on the flow sensor during fitting as damage to the sensor may result. The use of a water filter immediately upstream of the flow sensor is recommended. Ensure flow is in the direction as indicated on the flow sensor.

The female connector is valved. The valve is opened once the male end on the delivery tube is pushed home.

Connect the signal cable from the flow sensor into the Select-640 doser unit. Connect the Select-640 doser to either battery or transformer. Choose program options from the control screen. Ensure pump tube fitted and connected to inlet and outlet delivery tubes. Place inlet tube weight into additive liquid. Connect delivery outlet tube into quick-fit connector clamp. Commence proportional dosing.

Note: The pump will self prime. The pump can also be run dry without damaging any parts although it is not recommended to run the pump dry for extended periods.

Pumping Problems / Errors

If the Select-640 doser fails to operate correctly, check the following: (If the problem can not be resolved – contact your Distributor)

Problem	Solution
Error message "High Water" showing on screen.	<ol style="list-style-type: none"> 1. Problem may have passed, check if max. water flow is still being exceeded 2. Consider using more concentrated stock solution at a lower inclusion ratio. 3. Possible pump fault. Contact your Distributor.
Incorrect dosing.	<ol style="list-style-type: none"> 1. Check for low battery power (if external battery is in use) 2. Pump tube should be replaced regularly. Replace if necessary 3. Flow sensor could be entangled with debris. Check and clean if necessary. NOTE: clear carefully – delicate mechanism. Fit filter up-stream of sensor and clean regularly. 4. Is correct dosing ratio selected? 5. Water pressure in the drinking water line should not exceed 2 bar. Fit pressure reduction device if necessary. 6. Incorrect Tube Adjust Factor entered on the control screen. Check and re-enter. 7. Incorrect pump tube fitted. Are screen details correct?
Medication not being pumped from stock container.	<ol style="list-style-type: none"> 1. Check all tube connections are firmly in place. 2. Pump rotor may not be fully occluding the pump tube. Release cross-head adjustment screws on rotor as described in the section "Rotor Adjustment" above. (See "pressure loss" below) 3. Inlet tube could be blocked. Clear as necessary. 4. If a knife has been used to free a tube connector on the inlet side of the pump, the connector could be damaged and letting air into the suction line.
Sudden loss of pumping pressure (with possible return of fluid into stock container)	<ol style="list-style-type: none"> 1. Check if there is any lateral movement in the rotor. It is possible the rotor shaft bearings may have worn. Consult Distributor. 2. Check for physical damage to pump head fixing screws. 3. Check that non-return valve is fitted in delivery line
Error message "pump error"	A failure of the motor or data encoder is indicated.

	Check that connections to circuit board from motor are in place. Consult Distributor.
Proportional dosing does not commence	<ol style="list-style-type: none"> 1. Check flow sensor connected 2. Check there is water flow 3. Is power supply sufficient?

Maintenance

Weekly

Flush out filters protecting the flow sensor.
 Inspect the pump tube for signs of wear.
 Check doser output. Adjust as necessary via the control screen.

Monthly

Replace pump tube monthly or sooner if any of the following occur:

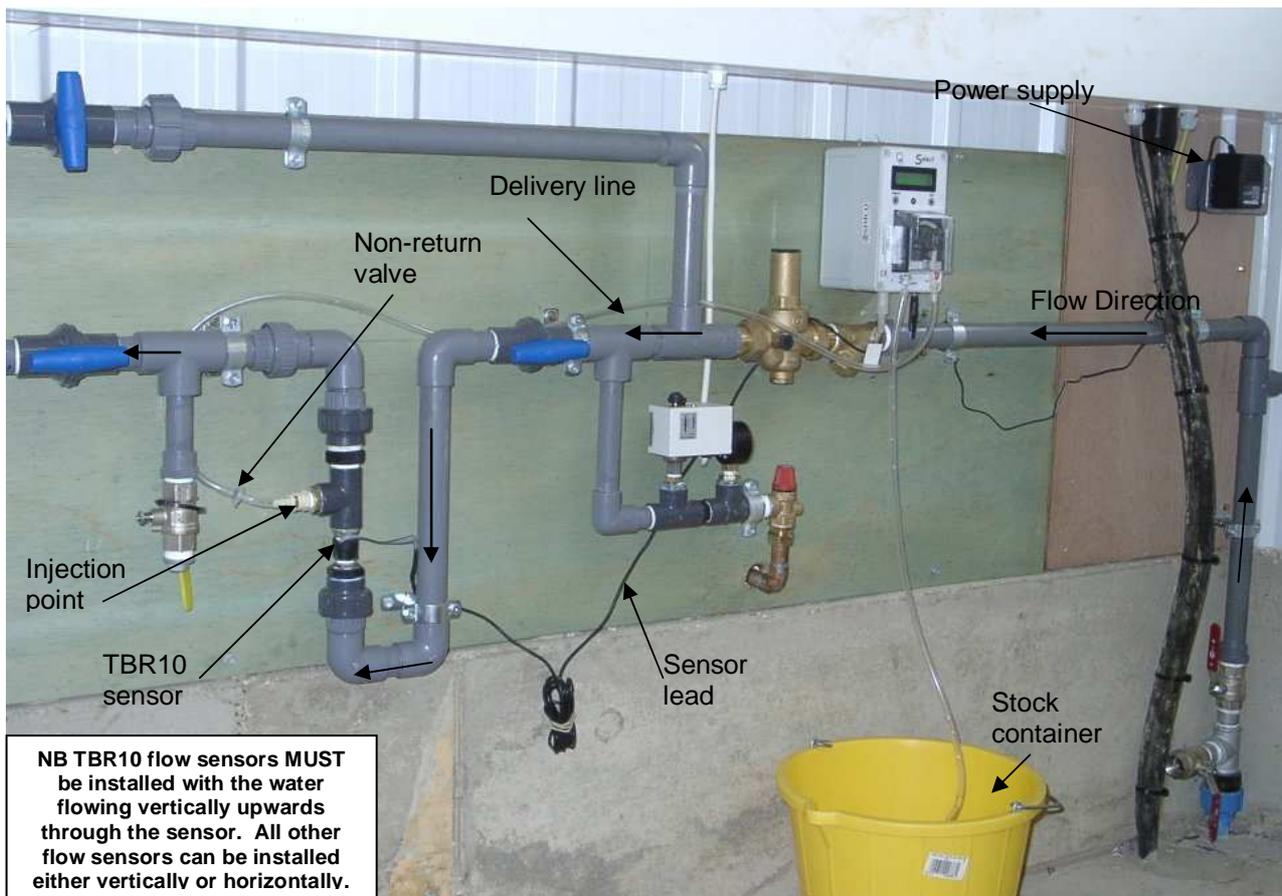
- Sharply increased rate of dosing
- Split tube

Each 6 Months

After disconnecting from electric supply, remove cover from Select-640 doser and inspect interior of pump enclosure. Ensure no ingress of moisture or other contaminant. In case of difficulty, contact your supplier.

Spare Parts and Accessories

Item		Code
Select-640 doser unit with VTY10 sensor	Unit	010CA10
Select-640 doser unit with VTH25 sensor	Unit	010CA25
Select-640 doser unit with VTH40 sensor	Unit	010CA75
Select-640 doser unit with TBR10 sensor	Unit	010CA50
Flow sensor (VTY10)	unit	160CA03
Flow sensor (VTH25)	unit	160CA05
Flow sensor (VTH40)	unit	160CA08
Replacement pump tube pack – 5 tubes	Grey	011CA63/REP
Replacement pump tube pack – 5 tubes	Purple	011CA48/REP
Delivery tube (low pressure)	30m	155CA48
Delivery tube (3m) plus end weight	unit	152CA05
Quick-fit male/female connector	unit	153CA02
Power supply 12V-DC 3.8A UK style	unit	019CA00
Power supply 12V-DC 3.8A EU style	unit	019CA10



Schematic Layout for VTY10 Sensor (similar for other sensors) Select-480 shown

