NDU-v3 Nutrient Dispensing Unit DATASHEET

FEATURES

- **6-Digit LCD display Litres counter.**
- **Easy rotary selection knobs for Water volume and pump time cycle.**
- **K-factor x1 or x10 input to suit most water flowmeters options.**
- **Simple to use and operate.**
- **Safety detection lockout system.**
- **Test function.**
- **Hinged IP65 cover protection.**
- **Easy pluggable modular system.**
- **Pulse output option for dataloggers.**

The NDU-v3 Nutrient Dosing Dispenser Unit was designed and manufactured by MANUFLO for automatic dosing of liquid nutrient into livestock's drinking troughs. The overall design of the system has taken into consideration of government departments (DPI-NT, AZRI-NT & DPIF-QLD) and the various farmers. *(This model supersedes the prev. V1 and V2 units).*

The complete NDU system comprised the following main components;-

- NDU-v3 Dosing Controller
- Solar panel and Rechargable +12VDC battery
- P75 Johnson diaphragm pump 2amp – 7.5 litres/min rate
- 20mm nutrient HR MV75 solenid valve. Float switch activates water pump/valve.
- Outer housing enclosure to protect the complete system.
- RPFS-L Rota Pulse water flow sensor with galvanised. pipe fitting of 23, 40 or 50mm pipe diameter *or optionally*
- MEHR 32, 40 or 50mm Multi-jet flowmeter *or*
- METP 40 or 50mm polyprop turbine flowmeter (new)

GENERAL OPERATION NDU-v3

To access the controls and function settings open the IP66 clear lid.

When water is flowing to fill the drinking trough, the flowmeter turns and sends pulses to the NDU controller. This is counted and the volume represented and shown on the 6 digit LCD-display in LITRES throughput. Select the amount of litres required to pass marked "WATERFLOW" on the two selector switch dials (selectable from 01 to 99 litres), the set value then activates the nutrient dosing pump to turn on and dose nutrient into the waterline at the selected time cycle. The time cycle is set by the rotary selector switch dial marked "PUMP CYCLE" and can be set from 1 to 9 seconds. When the pump is running for the time cycle set, the red LED marked "PUMP" illuminates. This sequences of operation of dosing nutrient will continue to repeat at the set volume of water per pump time ratio selected until there is no more water flow / or the pulses from the flowmeter cease.

The time cycle of nutrient dosing pump determines the volume e.g. each second represents 100mls of fluid, i.e. 3 sec. = 300mls dosed per water volume trigger selected. The total volume of water recorded can be reset to zero via the RESET push button.

If by some chance the dosing pump seized or did not stop at the chosen seconds duration setting, then the safety lock out relay feature cuts off and stops pump after approx.. 12 seconds. Two red LED's indicate the operational safety status. The left LED marked "LOCKED" illuminates when the safety lockout has occurred. The right LED marked "PUMP" is illuminated while the pump is operating as per normal dose cycle time duration.

If a safety lockout has occurred, to restart or reset the system safety lockout timer, then interrupt voltage supply to unit by switching the OFF/ON toggle switch to OFF for 10 seconds. Turn on again, the NDU dispenser controller is ready again.

Where optionally fitted a pulse-output facility of 1 pulse per 1 litre is fitted for transmission/collection of water volume to a datalogger. e.g. ManuFlo's ME-USB5+ stick USB event logger (download to a PC) or to any logger with remote wireless communication.

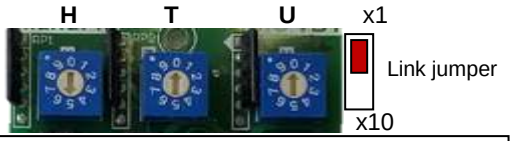
If in doubt, then call ManuFlo for advise.

SETUP INSTRUCTIONS — NDU-v3

Make sure the pump and solar panel and re-chargeable battery are correctly wired to the systems 3pin plug/socket. The float switch is wired into the pump circuit.
Check that the selected flowmeter's pulse value (refer Calibration) is correctly matched to the "HTU" 0-9 blue K-factor selector pots (use flat blade screwdriver to select), also that the flowmeter cable is plugged into the 4pin plug socket.

CALIBRATION SETUP of water Flowmeter

1) The NDU Controller is initially setup to match the connected flowmeter's pulse output value using the units Calibration rotary selector pots, marked HUNDREDS "H", TENS "T" and UNITS "U" .
Also the x1 and x10 must also be set via the link jumper.
The x10 setting is only used for low resolution or non-unity pulse values. (refer to chart for settings).



Example pulse flowmeter calibration settings:
Note: x1 pulse input multiplier is set.

Flowmeter Code.	Size Ø	Pulses / Liter.	Signal input link multiplier	H T U setting	Flowrate measurement range (Litres/min.)	
RPFS-L-GAL32	32mm	46	x 10	4 6 0	30 – 380 LPM	Insertion rotor
RPFS-L-GAL40	40mm	30	x 10	3 0 0	50 - 640	"
RPFS-L-GAL50	50mm	20	x 10	2 0 0	90 - 980	"
MEH32R1	32mm	1	x 1	0 0 1	2 - 200	Multi-jet
MEH40R1	40mm	1	x 1	0 0 1	4 - 330	"
MEH50R1	50mm	1	x 1	0 0 1	8 - 500	"
METP40	40mm	30	x 10	3 0 0	7 - 250	Turbine
METP50	50mm	13.7	x 10	1 3 7	10 - 350	"

On-site calibration adjustment and test:

An initial one off check should be conducted to see that the water volume collected matches as shown and counted on LCD display.

2) If necessary must adjust what is shown on the LCD display to match a known amount collected, using the HTU pots.
3) If the amount collected is **more** than is shown on the LCD display, then **decrease** the calibration value by the same % difference
e.g. if collected 55L when 50L on LCD, this is 5L more or 10% over (5/50x100%). So, decrease the calibration value by 10% i.e. if calibration set to 200, new value is 200-10% = 200-20 = 180 (Set Calibration U=1, T=8, H=0).
4) If the amount collected is **less** than shown on the LCD display, then **increase** the set calibration value by the same % difference.

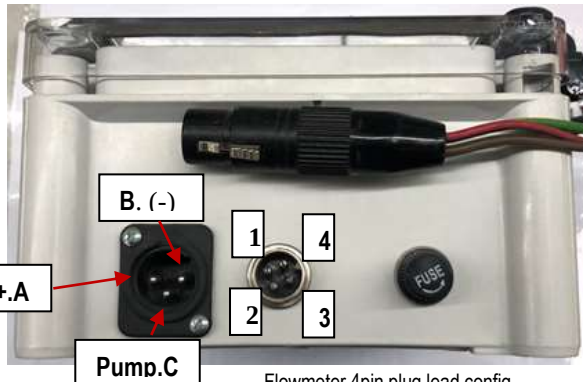
RPFS *paddle rotor with pipe fitting*

MEHR *Mult-jet with mechanical totalizer c/w couplings*

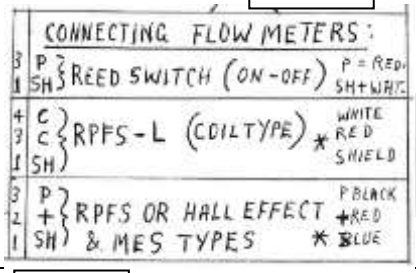
METP *Turbine with polyprop unions*

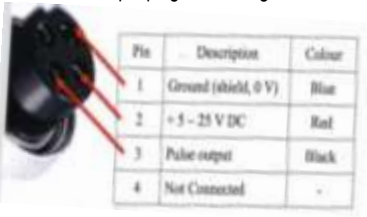
SPECIFICATIONS — NDU-v3

Power supply to unit	12 VDC standing,
Output to flowmeter	12 VDC upto 100mA (accepts contact closure input).
Pulse input	Accepts NPN, Contact closure or Coil.
Relay outputs	Standard Max. 10amps.
Frequency input	3.5 KHz: x1 input, 350 Hz: x10 input.
Display	6 digit LCD with memory.
Connection	3pin plug & socket for pump/power, 4pin for flowmeter, 2 pin for optional pulse output.
Fuse	10 Amp (5 x 20mm case)
Batch/time selections	Visual rotary select knob switches
On/Off & Test	Toggle switch and push button
Mounting	Panel mount via screw holes /internal
Weather Rating	IP66 ABS enclosure with hinged lid
Instrument housing	ABS hi-impact case mould
NDU Box dimensions	210 L, 160 W, 95 H mm.
Weight	1 kg.
Pump Drive/Pwr wiring	A = '+', B = '-', C = + pump drive. (red) (green) (brown)



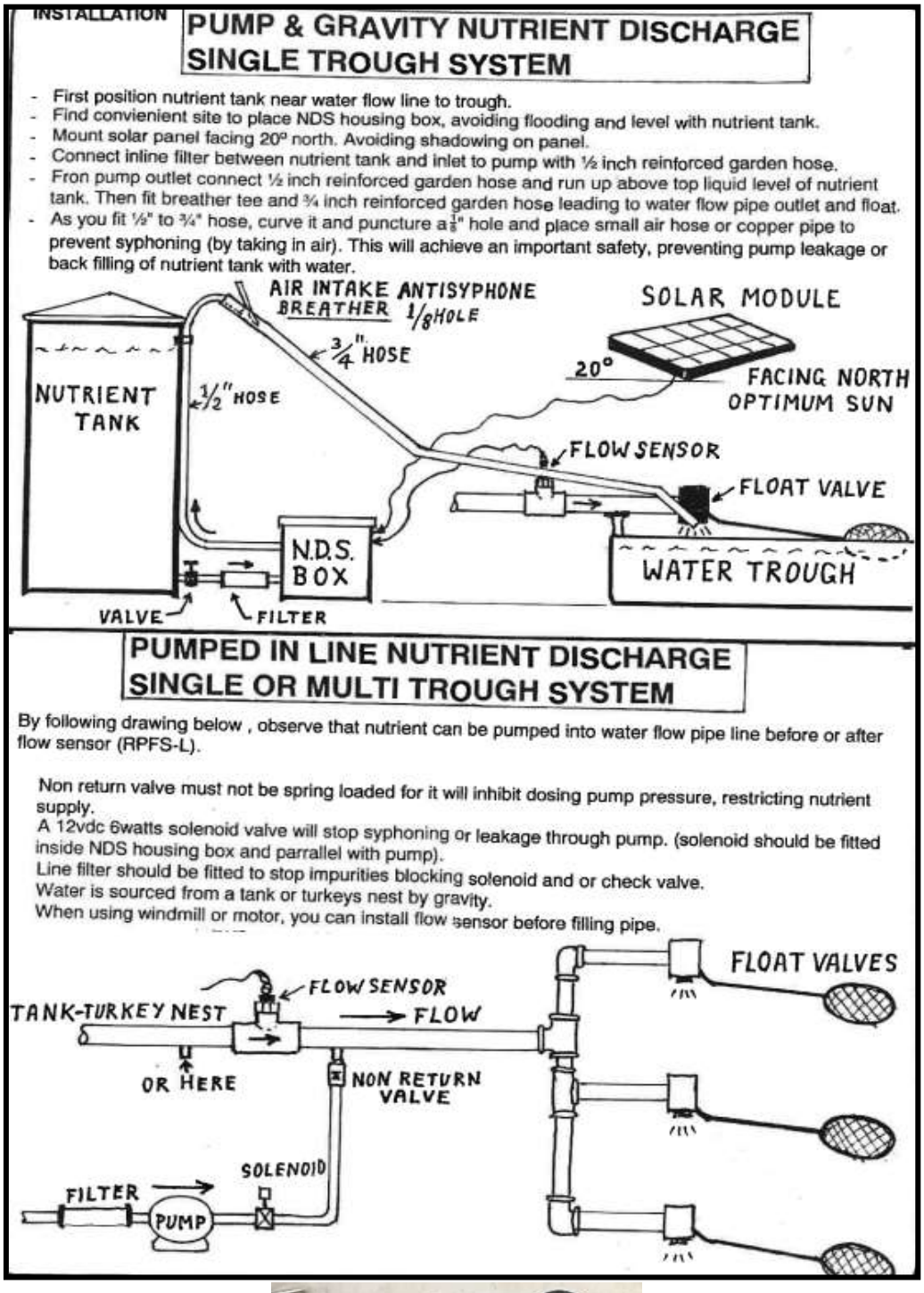
Flowmeter 4pin plug lead config.





ORDERING CODES — NDU-v3

Code	Description
NDU-V3	Nutrient Dispensing Dosing Controller Unit, +12 VDC powered. (+12vdc pwr to flowmeter & 10amp drive to pump.
-PO1 **-PO10**	Pulse output 1 per 1 litre. Pulse output 1 per 10 litres.



Johnson Pump
Model: P75

The NDU Nutrient dispenser measures water flow via a selected flowmeter. The water volume is displayed. When the preset volume of water passes the sensor, a diaphrapm pump (Johnson P75) is initiated and injects a measured timed amount of 0.125 litres per second (approx..) of nutrient into the water line.
Therefore the amount is dosed at 0.125 litres per second for proportionately to the set volume of water flowing and the nutrient nicely mixed with the water.

A +12VDC solenoid can be fitted to prevent any suction / passive flow of nutrient. The NDU has a electronic safety over-ride system fitted in the event of the pump operating overa period of 12 second period. This stops flow of nutrient to the water line. An air relief valve can be fitted for low head installation protection.

Advantages of NDU-v3 Nutrient Dispensing water Medication.
Supplementing with loose mixes and lick blocks, intakes vary widely between the animals. Bulls will overconsume while shy feeders (maybe 10-15%) could miss out completely.

When livestock are supplemented through the drinking ater, all animals automatically receive the supplement in a known measure. Any soluble nutrient can be fed through this water medication process.

The unit is safe and reliable with the first previous models installed back in 1991. Today as of year 2001, many farmers still use the NDU-v2 and NDU-v3 dosing controllers. That's upto 30 years of performance reliability.!

Units can be installed in 1 trough or in line for injection to multiple troughs.
Installation is simple and very easy to maintain.
Will operate at very low ater pressures.
Provides very accurate dosing of nutrient.
Safety circuits to prevent overdosing or pump burn outs.
Can operate from a 240vac to 12VDC power supply if preferred.

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