

Pump Control





AC Variable Speed Drive

37.5

(1) Invertek

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## PUMP CONTROL Energy efficient pumping with **OPTIFL**



Low Harmonic Design EN 61000-3-12 Compliant

0.75kW-250kW / 1HP-350HP 200-600V Single & 3 Phase Input



AC Variable Speed Drive

0.75 – 250kW / 1HP – 350HP 200 – 600V Single & 3 Phase Input



#### **Energy Efficient Pumping**

When a pump or pump set is selected, it must be suitable for operation during periods of maximum flow demand. In many applications, this maximum flow level may be rarely required, and as such the pump may operate for long periods at less than maximum flow capacity. By varying the speed of the pump to match the actual flow demand, significant energy savings are possible.

Optidrive Eco Pump has been designed to maximise the energy savings potential in pumping applications, whilst also providing significant additional benefits in reduced installation costs, maintenance costs and downtime. Throughout all this, Invertek's "Ease of Use" philosophy ensures that advanced features are simple to commission, without requiring extensive, in depth knowledge of a huge number of parameters. Optidrive Eco Pump has a simple menu structure, and provides just the right amount of parameters to allow flexibility without over complication.

Overall, this provides the perfect balance of Easy to Install, Easy to operate, Advanced Pump Control.







#### Energy Savings Calculator

Estimate your potential energy savings, CO<sub>2</sub> emissions and financial savings





## Save Energy

**Eco vector operation**, based on Invertek's advanced motor control provides the most energy efficient operation of the pump, continually optimising the output to match the required flow with minimum energy consumption.

Advanced sleep & wake functions provide maximum energy savings by switching off the pump when not required

## Save Money

**OPTIFL W**<sup>T</sup> **technology** allows simple operation of multiple pump sets without the need for a PLC

Pump blockage detection and cleaning dramatically reduces pump maintenance requirements

**Built in PLC function** allows bespoke customised applications to be programmed directly in the drive

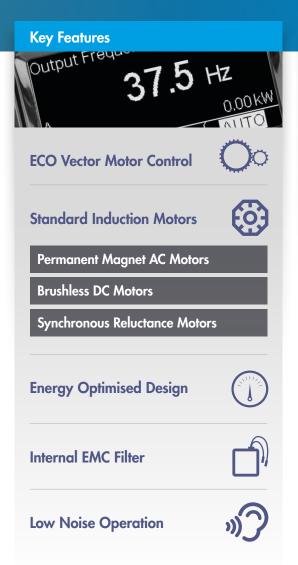
## Save Time

Save Energy, Cut CO

Simple parameter set allows fast commissioning of pump control systems

Pump operating curve detection automatically detects and monitors normal pump behaviour and is able to react when pumping conditions change

**Customisable OLED display** provides excellent visibility of drive status and operation in all conditions

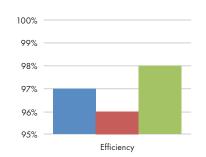


#### **Maximum Pumping Efficiency**

#### Unique Eco Vector Sensorless Control

Optidrive Eco Pump uses advanced motor control technology, designed to provide the most energy efficient motor control possible. Operation with standard IM Motors, Permanent Magnet or Synchronous Reluctance motors is possible, all without requiring any feedback device or optional modules – simply change parameters to suit the connected motor, autotune and operate!

Eco Vector continuously adjusts in real time to provide the most efficient operating conditions for the load, typically reducing energy consumption by 2 – 3% compared to standard AC drives – providing similar long term costs savings to selecting a higher efficiency motor.



#### **Energy Optimised Design**

Optidrive Eco Pump up to frame size 5 are designed with film capacitors, replacing the traditional electrolytic capacitors used in the DC link. Film capacitors have lower losses, and also remove the need for AC, DC or swinging chokes, improving overall drive efficiency. Efficiency is improved by up to 4% compared to standard AC drives, whilst also reducing supply current total harmonic distortion (iTHD), improving the Real Power Factor and reducing total input current, leading to cost savings on installation through reduced cable and fuse ratings and smaller supply transformer rating.

Improved Efficiency, Reduced Lifetime Costs: e.g. for a 37kW load, operating 10 hours per day, 5 days per week, 50 weeks per year, improving the efficiency by just 1% will provide an energy saving > 900kWh per year.

Typical efficiency comparison for Optidrive Eco Pump vs other AC variable speed drives

Standard AC Variable Speed Drive AC Variable Speed Drive + 4% Line Choke Optidrive Eco Pump

# **OPTIFL W**<sup>™</sup> Multi-pump Control

Embedded control technology for multi-pump systems



### **Total Control**

A single 'Master' drive acts to control and monitor system operation. Control connections are made to this drive only, saving installation time and reducing costs.

### Simple Connection

Additional drives connected on the system require a single RJ45 connection and basic commissioning, leading to time savings and simplified installation.

### **Flexible Solution**

The system can operate with up to five pumps in any configuration, e.g. Jockey Pump / Duty / Assist / Standby. Duty pumps are automatically rotated, ensuring maximum service life and system efficiency.



### Energy efficient pumping with **OPTIFLOW**



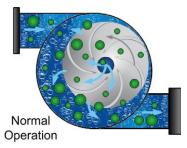
## See OPTIFL**O**W<sup>™</sup> in action

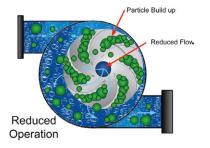
Scan to watch the video or visit http://youtu.be/9QQ89bQYdfs

#### **Avoid Pump Downtime**

#### **Blockage Detect/Clear**

Optidrive Eco Pump can detect pump blockages and trigger a programmed cleaning cycle to automatically clear them, preventing downtime.





#### **Dry Run Protection**

Optidrive Eco Pump can evaluate a pump's speed/power and shut it off or warn when the pump starts to run dry, protecting it from heat/friction damage.

#### **Motor Preheat Function**

Optidrive Eco Pump features a motor preheat function to help ensure moisture is not permitted to collect on the motor in periods of inactivity and prior to motor start up. In addition, the motor preheat function can be used to keep condensation from developing on the motor as the motor cools down immediately following a stop. The feature is fully configurable, meaning the pump can be always available the instant it is required.

#### **Pump Stir Cycle**

Triggered by a settable period of inactivity, a configurable cleaning cycle can be run to clear sediment, ensuring the pump is ready to run when needed.

#### Summary

- All drives operate at variable speed for maximum energy efficiency.
- Operating time (Hours Run) is automatically balanced and duty pumps rotated
- Automatic system reconfiguration in the event of a pump fault (including the master pump).
- Continued system operation when drives are individually powered off (including the master drive).
- Communication and +24V control voltage shared between drives via a standard RJ45 patch lead.
- Independent maintenance indicators for each pump.
- Any pump can be switched to Hand operation a the touch of a button, and will automatically rejoin the network when switched back to Auto.
- For waste water applications each pump can be set for blockage/ragging detection and activate an automatic de-ragging/pump cleaning cycle.
- Optional mains isolator with lock-off for safe pump maintenance.
- Optiflow function configured through simple parameter set-up and intelligent drive self configuration.

#### **Consistent Flow**



The required pressure and flow levels are maintained regardless of how many pumps are required. When demand increases, additional pumps are automatically brought on stream to assist and are switched off again when not required.



## **Reduced Downtime**

In the event of a fault, or if a pump needs to be isolated for maintenance, the system will automatically continue to operate with the remaining available pumps. The mains power can even be completely isolated from the Master drive without affecting operation of the Slave drives.

## **Drive Features**

A compact and robust range of drives dedicated to pump control





## Energy efficient pumping with **OPTIFL**



#### **Noise Reduction**



#### **Quiet Motor Operation**

High switching frequency selection (up to 32kHz) ensures motor noise is minimised.

#### **Quiet System Mechanics**

Simple skip frequency selection avoids stresses and noise caused by mechanical resonance in pipework.

#### **Quiet Drive Operation**

Long Life Dual Ball Bearing Fans provide quiet operation in addition to extended fan life.

#### Noise Reduction through Speed Control

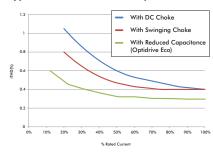
Optimising motor speed gives significant energy savings and reduces motor noise.

#### **Reduced Harmonic Current Distortion**

Optidrive Eco Pump uses innovative design to improve overall efficiency whilst minimising the harmonic distortion levels. All drives designed for 3 phase power supply operation<sup>1</sup> up to frame size 5 utilise film capacitor in the DC link, providing exceptionally low harmonic current distortion without compromising efficiency. Frame size 6 and above include DC chokes and traditional electrolytic capacitors.

Optidrive Eco Pump product range complies with the requirements of EN61000-3-12.

#### Typical iTHD values at full and part load

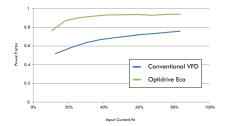


It can be clearly seen that the reduced DC link capacitance significantly reduces the total harmonic distortion at full load, and has a much greater benefit at part load compared to a conventional DC choke or swinging choke. This results in reduced overall input current and reduced transformer heating effect.

#### **Optidrive Eco Pump delivers**

- Improved Efficiency, Reduced Lifetime Costs: e.g. for a 37kW load, operating 10 hours per day, 5 days per week, 50 weeks per year, improving the efficiency by just 1% will provide an energy saving > 900kWh per year
- Improved True Power Factor No additional charges etc.
- Lower Mains Supply Current

#### Power factor comparison



Optidrive Eco offers improved power factor over conventional VFDs under all loads.

## **Options & Accessories**

Peripherals to help integrate Optidrive Eco Pump with your pumping systems





## Energy efficient pumping with **OPTIFL**



### **Powerful PC Software**

## Drive commissioning and parameter backup

- Real-time parameter editing
- Drive network communication
- Parameter upload, download and storage
- Simple PLC function programming
- Real-time scope function and data logging
- Real-time data monitoring

#### Compatible with:

Windows Vista Windows 7 Windows 8 Windows 8.1 Windows 10

#### **Fieldbus Interfaces**



## Plug-in Options



Extended I/O OPT-2-EXTIO-IN • Additional 3 Digital Inputs • Additional Relay Output

#### Cascade Control OPT-2-CASCD-IN Additional 3 Relay Outputs

#### **Mains Isolator**



#### Mains Isolator Option

Frame Sizes 2 & 3 can be factory ordered with a built in lockable isolator. An optional bolt on isolator is available for Frame Sizes 4 & 5.

Product Codes: Frame Size 4 = OPT-2-ISOL4-IN Frame Size 5 = OPT-2-ISOL5-IN

BACnet MS/TP & Modbus RTU on board as standard

# **ec**() optidrive

200-240V±10% 1/Phose Input     0.75     1     4.3     2       2.2     3     10.5     2     0.07.5     1     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     3     0.07.5     0.07.5     0.07.5     0.07.5		kW	HP	Amps	Frame Size	Monoching Control of C
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45     60     180     68     ODV - 3 - 6 2 1800 - 3 F 1       75     100     248     7     ODV - 3 - 7 2 2020 - 3 F 1       75     100     248     7     ODV - 3 - 7 2 2020 - 3 F 1       75     100     248     7     ODV - 3 - 7 2 2020 - 3 F 1       15     2     4.1     2     ODV - 3 - 2 4 0021 - 3 F 1       12.2     3     5.8     2     ODV - 3 - 2 4 0021 - 3 F 1       5.5     7.5     14     2     ODV - 3 - 2 4 0021 - 3 F 1       5.5     7.5     14     2     ODV - 3 - 2 4 0021 - 3 F 1       0DV - 3 - 2 4 0014 - 3 F 1     ODV - 3 - 2 4 0014 - 3 F 1     ODV - 3 - 2 4 0014 - 3 F 1       5.5     7.5     14     2     ODV - 3 - 2 4 0014 - 3 F 1       11     15     20     30     4       30     40     61     5     ODV - 3 - 4 0200 - 3 F 1       30     40     61     5     ODV - 3 - 4 0200 - 3 F 1       30     40     61     5     ODV - 3 - 6 4 1100 - 3 F 1       0DV - 3 - 5 4 0700 - 3 F 1		_				
350 - 480V ± 10%     375     100     248     7     0DV - 3 - 7 2 2020 - 3 F 1       0.75     100     248     7     0DV - 3 - 7 2 2480 - 3 F 1       1.5     2     4.1     2     0DV - 3 - 2 4 0022 - 3 F 1       1.5     2     4.1     2     0DV - 3 - 2 4 0021 - 3 F 1       2.2     3     5.8     2     0DV - 3 - 2 4 0021 - 3 F 1       5.5     7.5     14     2     0DV - 3 - 2 4 0021 - 3 F 1       5.5     7.5     14     2     0DV - 3 - 2 4 0021 - 3 F 1       5.5     7.5     14     3     0DV - 3 - 2 4 0021 - 3 F 1       0DV - 3 - 3 4 0140 - 3 F 1     0DV - 3 - 3 4 0140 - 3 F 1     0DV - 3 - 3 4 0140 - 3 F 1       0DV - 3 - 3 4 0140 - 3 F 1     0DV - 3 - 4 0460 - 3 F 1     0DV - 3 - 4 0460 - 3 F 1       380 - 480V ± 10%     37     50     72     5       30     40     61     5     0DV - 3 - 4 0460 - 3 F 1       0DV - 3 - 5 4 0700 - 3 F 1     0DV - 3 - 6 4 1500 - 3 F 1     0DV - 3 - 6 4 1500 - 3 F 1       0DV - 3 - 6 4 1500 - 3 F 1     0DV - 3 - 6 4 1500 - 3 F 1     0DV - 3 - 6 4 1500 - 3 F 1 </td <td></td> <td></td> <td></td> <td></td> <td></td> <td></td>						
75     100     248     7     ODV - 3 - 7 2 2480 - 3 F 1       0.75     1     2.2     2     ODV - 3 - 2 4002.3 F 1       1.5     2     4.1     2     ODV - 3 - 2 4002.3 F 1       2.2     3     5.8     2     ODV - 3 - 2 4002.3 F 1       5.5     7.5     14     2     ODV - 3 - 2 4002.3 F 1       5.5     7.5     14     2     ODV - 3 - 2 4004.3 F 1       7.5     10     18     3     ODV - 3 - 2 4004.3 F 1       7.5     10     18     3     ODV - 3 - 3 40140.3 F 1       7.5     10     18     3     ODV - 3 - 3 40240.3 F 1       7.5     10     18     3     ODV - 3 - 40300.3 F 1       7.5     10     18     3     ODV - 3 - 40300.3 F 1       7.5     10     16     5     7       30     40     61     5     0DV - 3 - 40300.3 F 1       75     100     150     6A     ODV - 3 - 641100.3 F 1       75     100     150     6A     ODV - 3						
380-480V±10%     1.5     2     4.1     2     0DV - 3 - 2 4 0041 - 3 F 1       5.5     7.5     14     2     0DV - 3 - 2 4 0045 - 3 F 1       5.5     7.5     14     2     0DV - 3 - 2 4 0040 - 3 F 1       5.5     7.5     14     3     0DV - 3 - 2 4 0040 - 3 F 1       7.5     10     18     3     0DV - 3 - 3 4 0140 - 3 F 1       7.5     10     18     3     0DV - 3 - 3 4 0140 - 3 F 1       11     15     20     30     3     0DV - 3 - 4 4 0300 - 3 F 1       15     20     30     4     0DV - 3 - 4 4 0460 - 3 F 1     0DV - 3 - 4 4 0460 - 3 F 1       30     40     61     5     0DV - 3 - 5 4 0720 - 3 F 1     0DV - 3 - 5 4 0720 - 3 F 1       30     40     61     5     0DV - 3 - 5 4 0610 - 3 F 1     0DV - 3 - 6 4 1100 - 3 F 1       37     50     72     5     0DV - 3 - 6 4 1100 - 3 F 1     0DV - 3 - 6 4 1100 - 3 F 1       90     150     6A     0DV - 3 - 6 4 1100 - 3 F 1     0DV - 3 - 6 4 1800 - 3 F 1       90     150     180						
380-480V±10%     3     5.8     2     ODV - 3 · 2 4 0058 · 3 F 1       380-480V±10%     5.5     7.5     14     2     ODV - 3 · 2 4 0140 · 3 F 1       11     15     2.4     3     ODV - 3 · 2 4 0140 · 3 F 1     ODV - 3 · 3 4 0140 · 3 F 1       11     15     2.0     30     3     ODV - 3 · 3 4 0140 · 3 F 1       15     20     30     3     ODV - 3 · 3 4 0240 · 3 F 1       15     20     30     4     ODV - 3 · 4 4 0300 · 3 F 1       15     20     30     4     ODV - 3 · 4 4 0460 · 3 F 1       380-480V±10%     37     50     72     5       30     40     61     5     ODV · 3 · 4 0460 · 3 F 1       37     50     72     5     ODV · 3 · 5 4 0700 · 3 F 1       0DV · 3 · 5 4 0700 · 3 F 1     ODV · 3 · 6 4 1100 · 3 F 1     ODV · 3 · 6 4 1100 · 3 F 1       75     100     150     6A     ODV · 3 · 6 4 1100 · 3 F 1       90     150     180     6B     ODV · 3 · 6 4 1100 · 3 F 1       90     150     180     6B						
4     5     9.5     2     ODV - 3 - 2 4 0095 - 3 F 1       5.5     7.5     14     2     ODV - 3 - 2 4 0140 - 3 F 1       7.5     10     18     3     ODV - 3 - 3 4 0140 - 3 F 1       7.5     10     18     3     ODV - 3 - 3 4 0140 - 3 F 1       15     20     30     3     ODV - 3 - 3 4 0240 - 3 F 1       15     20     30     4     ODV - 3 - 3 4 0240 - 3 F 1       15     20     30     4     ODV - 3 - 4 4 0300 - 3 F 1       15     20     30     4     ODV - 3 - 4 4 040 - 3 F 1       380 - 480V ± 10%     37     50     72     5       37     50     72     5     ODV - 3 - 5 4 0700 - 3 F 1       0DV - 3 - 5 4 0700 - 3 F 1     ODV - 3 - 6 4 1800 - 3 F 1     ODV - 3 - 6 4 1800 - 3 F 1       75     100     150     6A       90     150     180     6B       100     175     100     150       10     175     022     7       0DV - 3 - 6 4 1800 - 3 F 1     ODV - 3 - 6						
380-480V±10% 3 Phase Input     5.5     7.5     14     3     ODV - 3 - 3 4 0140 - 3 F 1 ODV - 3 - 3 4 0180 - 3 F 1 ODV - 3 - 3 4 0240 - 3 F 1 ODV - 3 - 3 4 0240 - 3 F 1 ODV - 3 - 4 4 0300 - 3 F 1 ODV - 3 - 4 4 0300 - 3 F 1 ODV - 3 - 4 4 0300 - 3 F 1 ODV - 3 - 4 4 0400 - 3 F 1 ODV - 3 - 4 4 0400 - 3 F 1 ODV - 3 - 5 4 0610 - 3 F 1 ODV - 3 - 5 4 0610 - 3 F 1 ODV - 3 - 5 4 0610 - 3 F 1 ODV - 3 - 5 4 0610 - 3 F 1 ODV - 3 - 5 4 0610 - 3 F 1 ODV - 3 - 5 4 0610 - 3 F 1 ODV - 3 - 6 4 1100 - 3 F 1 ODV - 3 - 6 4 1100 - 3 F 1 ODV - 3 - 6 4 1100 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 6 4 1500 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 7 4 2020 - 3 F 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0021 - 3 0 1 ODV - 3 - 2 6 0020 - 3 0 1 ODV - 3 - 2 6 0020 - 3 0 1 ODV - 3 - 2 6 0020 - 3 0 1 ODV - 3 - 2 6 0020 - 3 0 1 ODV - 3 - 4 6 0220 - 3 0 1 ODV - 3 - 4 6 0220 - 3 0 1 ODV - 3 - 4 6 0220 - 3 0 1 ODV - 3 - 4 6 0230 - 3 0 1 ODV - 3 - 4 6 0230 - 3 0 1 ODV - 3 - 4 6 0230 - 3 0 1 ODV - 3 - 4 6 0230 - 3 0 1		_				
380-480V±10%     7.5     10     18     3     ODV 3 · 3 4 0180 · 3 F 1       380-480V±10%     15     20     30     4     ODV 3 · 3 4 0300 · 3 F 1       380-480V±10%     22     30     4     ODV 3 · 3 4 0300 · 3 F 1       380-480V±10%     37     50     72     5       380 - 480V±10%     55     75     110     6A       75     100     150     6A     ODV · 3 · 6 4 1800 · 3 F 1       90     150     180     6B     ODV · 3 · 6 4 1800 · 3 F 1       90     150     180     6B						
380-480V±10%     11     15     24     3     3     ODV - 3 - 3 4 0240 - 3 F 1       380-480V±10%     15     20     30     4     ODV - 3 - 4 4 0300 - 3 F 1       380-480V±10%     37     50     72     5     ODV - 3 - 5 4 0610 - 3 F 1       380-480V±10%     37     50     72     5     ODV - 3 - 5 4 0610 - 3 F 1       380-480V±10%     37     50     72     5     ODV - 3 - 5 4 0610 - 3 F 1       380-480V±10%     37     50     72     5     ODV - 3 - 5 4 0610 - 3 F 1       380-480V±10%     37     50     72     5     ODV - 3 - 5 4 0720 - 3 F 1       37     50     75     110     6A     ODV - 3 - 6 4 1500 - 3 F 1       75     100     150     6A     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1500 - 3 F 1       100     175     202     7     ODV - 3 - 6 4 1500 - 3 F 1       100     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       100     175     12.1						
15     20     30     4     ODV - 3 - 4 4 0300 - 3 F 1       18.5     25     39     4     ODV - 3 - 4 4 0300 - 3 F 1       22     30     46     4     ODV - 3 - 4 4 0460 - 3 F 1       30     40     61     5     ODV - 3 - 5 4 0610 - 3 F 1       37     50     72     5     ODV - 3 - 5 4 0700 - 3 F 1       0DV - 3 - 5 4 0700 - 3 F 1     ODV - 3 - 5 4 0700 - 3 F 1     ODV - 3 - 6 4 1100 - 3 F 1       55     75     110     6A     ODV - 3 - 6 4 1100 - 3 F 1       0DV - 3 - 6 4 1100 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       100     175     100     7     ODV - 3 - 7 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       100     250     300     7     ODV - 3 - 7 4 2020 - 3 F 1       100     250     302     7     ODV - 3 - 2 6 0021 - 3 0 1						
18.5     25     39     4     ODV - 3 - 4 4 0390 - 3 F 1       380-480V±10%     30     40     61     5       37 50     72     5     ODV - 3 - 5 4 0610 - 3 F 1       380-480V±10%     37     50     72     5       45     60     90     5     ODV - 3 - 5 4 0720 - 3 F 1       55     75     110     6     ODV - 3 - 5 4 0720 - 3 F 1       55     75     110     6     ODV - 3 - 5 4 0720 - 3 F 1       75     100     150     6     ODV - 3 - 6 4 1100 - 3 F 1       75     100     150     6     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6     ODV - 3 - 6 4 1800 - 3 F 1       100     175     020     7     ODV - 3 - 7 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       120     300     370     8     3002 - 7       200     300     370     8		_				
380-480V±10% 3 Phase Input     30     40     61     5       37     50     72     5     ODV - 3 - 5 4 0610 - 3 F 1       45     60     90     5     ODV - 3 - 5 4 0720 - 3 F 1       55     75     110     6     ODV - 3 - 6 4 1100 - 3 F 1       75     100     150     6     ODV - 3 - 6 4 1100 - 3 F 1       75     100     150     6     ODV - 3 - 6 4 1100 - 3 F 1       90     150     180     6     ODV - 3 - 6 4 1100 - 3 F 1       90     150     180     6     ODV - 3 - 6 4 1100 - 3 F 1       90     150     180     6     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6     ODV - 3 - 7 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       120     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1       250     350     450     8     ODV - 3 - 2 6 0021 - 3 0 1       0DV - 3 - 2						
380-480V±10% 3 Phase Input     37     50     72     5     ODV - 3 - 5 4 0720 - 3 F 1       45     60     90     5     ODV - 3 - 5 4 0720 - 3 F 1     ODV - 3 - 5 4 0700 - 3 F 1       55     75     110     64     ODV - 3 - 6 4 1100 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       75     100     150     6A     ODV - 3 - 6 4 1500 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1500 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1     ODV - 3 - 6 4 1800 - 3 F 1       100     175     202     6B     ODV - 3 - 6 4 1800 - 3 F 1     ODV - 3 - 7 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1     ODV - 3 - 7 4 3020 - 3 F 1       120     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1     ODV - 3 - 8 4 3700 - 3 F 1       200     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1     ODV - 3 - 2 6 0021 - 3 0 1       15.5     7.5     9     2     ODV - 3 - 2 6 0021 - 3 0 1     ODV - 3 - 2 6						
3 Phase input     45     60     90     5     ODV - 3 - 5 4 0900 - 3 F 1       55     75     110     6A     ODV - 3 - 6 4 1100 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       75     100     150     6A     ODV - 3 - 6 4 1500 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1500 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1500 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1500 - 3 F 1     ODV - 3 - 6 4 1500 - 3 F 1       100     175     202     7     ODV - 3 - 6 4 1800 - 3 F 1     ODV - 3 - 7 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1     ODV - 3 - 7 4 3020 - 3 F 1       1200     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1     ODV - 3 - 2 6 0021 - 3 0 1       15.5     2     3.1     2     ODV - 3 - 2 6 0021 - 3 0 1     ODV - 3 - 2 6 0021 - 3 0 1       15.5     7.5     9     2     ODV - 3 - 2 6 0001 - 3 0 1     ODV - 3 - 2 6 0001 - 3 0						
55     75     110     6A     ODV - 3 - 6 4 1100 - 3 F 1       75     100     150     6A     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6A     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       101     175     202     7     ODV - 3 - 6 4 1800 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1       15.5     2     3.1     2     ODV - 3 - 2 6 0021 - 3 0 1       0DV - 3 - 2 6 0041 - 3 0 1     0DV - 3 - 2 6 0041 - 3 0 1     0DV - 3 - 2 6 0041 - 3 0 1       5.5     7.5     9     2     0DV - 3 - 2 6 0041 - 3 0 1	3 Phase Input	45	60	90	5	ODV - 3 - 5 4 0900 - 3 F 1 #
75     100     150     6     ODV - 3 - 6 4 1500 - 3 F 1       75     100     150     6A     ODV - 3 - 6 4 1500 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       120     200     240     7     ODV - 3 - 7 4 2020 - 3 F 1       100     250     302     7     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1       200     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1       21     2     3     4.1     2       0DV - 3 - 2 6 0021 - 3 0 1     0     DV - 3 - 2 6 0021 - 3 0 1       0DV - 3 - 2 6 0021 - 3 0 1 <t< td=""><td></td><td></td><td></td><td></td><td></td><td>ODV - 3 - 6 4 1100 - 3 F 1 #</td></t<>						ODV - 3 - 6 4 1100 - 3 F 1 #
90     150     180     6     ODV - 3 - 6 4 1800 - 3 F 1       90     150     180     6B     ODV - 3 - 6 4 1800 - 3 F 1       110     175     202     6B     ODV - 3 - 6 4 1800 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       132     200     240     7     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1       250     350     450     8     ODV - 3 - 2 6 0021 - 3 0 1       0DV - 3 - 2 6 0031 - 3 0 1     0DV - 3 - 2 6 0031 - 3 0 1     0DV - 3 - 2 6 0031 - 3 0 1       5.5     7.5     9     2     0DV - 3 - 2 6 0065 - 3 0 1       500 - 600V ± 10%     15     20     22     3     0DV - 3 - 4 6 0220 - 3 0 1       500 - 600V ± 10%     15     20     22     3						ODV - 3 - 6 4 1500 - 3 F 1 #
90     150     180     66B     ODV - 3 - 6 4 1800 - 3 F 1       110     175     202     66B     ODV - 3 - 6 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       132     200     240     7     ODV - 3 - 7 4 2020 - 3 F 1       160     250     302     7     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 2 6 0021 - 3 0 1       250     350     450     8     ODV - 3 - 2 6 0021 - 3 0 1       0DV - 3 - 2 6 0021 - 3 0 1     2     0DV - 3 - 2 6 0031 - 3 0 1     ODV - 3 - 2 6 0031 - 3 0 1       22     3     4.1     2     0DV - 3 - 2 6 0030 - 3 0 1     ODV - 3 - 2 6 0030 - 3 0 1       500 - 600V ± 10%     15     20     22     3     ODV - 3 - 3 6 0120 - 3 0 1       500 - 600V ± 10%     15     20     2     4     ODV - 3 - 4 6 0220 - 3 0 1       500 - 60						ODV - 3 - 6 4 1500 - 3 F 1 #
110     175     202     66B     ODV - 3 - 6 4 2020 - 3 F 1       110     175     202     7     ODV - 3 - 7 4 2020 - 3 F 1       132     200     240     7     ODV - 3 - 7 4 2020 - 3 F 1       160     250     302     7     ODV - 3 - 7 4 2020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 3020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 3020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 3020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 3020 - 3 F 1       200     300     370     8     0DV - 3 - 2 6 0021 - 3 0 1       250     350     450     8     ODV - 3 - 2 6 0021 - 3 0 1       15.5     7.5     9     2     ODV - 3 - 2 6 0041 - 3 0 1       250     75     9     2     ODV - 3 - 2 6 0090 - 3 0 1       30     15     20     2     3       11     15     17     3     ODV - 3 - 3 6 0120 - 3 0 1       0DV - 3 - 4 6 02020 3 0 1<						
132     200     240     7     ODV - 3 - 7 4 2400 - 3 F 1       160     250     302     7     ODV - 3 - 7 4 3020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 3020 - 3 F 1       200     300     370     8     ODV - 3 - 8 4 3700 - 3 F 1       250     350     450     8     ODV - 3 - 8 4 4500 - 3 F 1       0DV - 3 - 8 4 4500 - 3 F 1     0DV - 3 - 2 6 0021 - 3 0 1     ODV - 3 - 2 6 0031 - 3 0 1       1.5     2     3.1     2     ODV - 3 - 2 6 0041 - 3 0 1       2.2     3     4.1     2     ODV - 3 - 2 6 0041 - 3 0 1       4     5     6.5     2     ODV - 3 - 2 6 0040 - 3 0 1       5.5     7.5     9     2     ODV - 3 - 2 6 0040 - 3 0 1       7.5     10     12     3     ODV - 3 - 2 6 0020 - 3 0 1       11     15     20     22     3       500 - 600V ± 10%     18.5     25     28     4       22     30     34     4     ODV - 3 - 4 6 0200 - 3 0 1       0DV - 3 - 4 6 0200 - 3 0 1		110	175	202	6B	ODV - 3 - 6 4 2020 - 3 F 1 #
160     250     302     7     ODV - 3 - 7 4 3020 - 3 F 1       200     300     370     8     ODV - 3 - 7 4 3020 - 3 F 1       250     350     450     8     ODV - 3 - 8 4 3700 - 3 F 1       0DV - 3 - 8 4 4500 - 3 F 1     ODV - 3 - 8 4 4500 - 3 F 1     ODV - 3 - 2 6 0021 - 3 0 1       1.5     2     3.1     2       2.2     3     4.1     2       4     5     6.5     2       5.5     7.5     9     2       7.5     10     12     3       11     15     17     3       500 - 600V ± 10%     15     20     22       3     Phase Input     18.5     25       3     Phase Input     18.5     25       30     40     43     4       30     40     4     5       37     50     54     5						ODV - 3 - 7 4 2020 - 3 F 1 #
250     350     450     8     ODV - 3 - 8 4 4500 - 3 F 1       0.75     1     2.1     2     ODV - 3 - 2 6 0021 - 3 0 1       1.5     2     3.1     2     ODV - 3 - 2 6 0021 - 3 0 1       2.2     3     4.1     2     ODV - 3 - 2 6 0021 - 3 0 1       4     5     6.5     2     ODV - 3 - 2 6 0041 - 3 0 1       5.5     7.5     9     2     ODV - 3 - 2 6 0065 - 3 0 1       5.5     7.5     9     2     ODV - 3 - 2 6 0090 - 3 0 1       7.5     10     12     3     ODV - 3 - 3 6 0120 - 3 0 1       11     15     20     22     3       500-600V±10%     15     20     22     4       3 Phase Input     18.5     25     28     4       22     30     34     4     ODV - 3 - 4 6 0430 - 3 0 1       30     40     43     4     ODV - 3 - 4 6 0430 - 3 0 1       30     40     4     5     ODV - 3 - 5 6 0540 - 3 0 1						ODV - 3 - 7 4 3020 - 3 F 1 #
0.75     1     2.1     2       1.5     2     3.1     2     ODV - 3 - 2 6 0021 - 3 0 1       1.5     2     3.1     2     ODV - 3 - 2 6 0021 - 3 0 1       2.2     3     4.1     2     ODV - 3 - 2 6 0041 - 3 0 1       4     5     6.5     2     ODV - 3 - 2 6 0041 - 3 0 1       5.5     7.5     9     2     ODV - 3 - 2 6 0065 - 3 0 1       7.5     10     12     3     ODV - 3 - 2 6 0090 - 3 0 1       11     15     17     3     ODV - 3 - 3 6 0120 - 3 0 1       500 - 600V ± 10%     15     20     22     4       500 - 800V ± 10%     15     20     22     4       3 Phase Input     18.5     25     28     4       22     30     34     4     ODV - 3 - 4 6 0430 - 3 0 1       30     40     43     4     ODV - 3 - 5 6 0540 - 3 0 1       37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1						ODV - 3 - 8 4 3700 - 3 F 1 #
1.5     2     3.1     2     ODV - 3 - 2 6 0031 - 3 0 1       2.2     3     4.1     2     ODV - 3 - 2 6 0041 - 3 0 1       4     5     6.5     2     ODV - 3 - 2 6 0041 - 3 0 1       5.5     7.5     9     2     ODV - 3 - 2 6 0040 - 3 0 1       7.5     10     12     3     ODV - 3 - 2 6 0090 - 3 0 1       11     15     17     3     ODV - 3 - 3 6 0120 - 3 0 1       500 - 600V ± 10%     15     20     22     3       500 - 600V ± 10%     15     20     22     4       3 Phase Input     18.5     25     28     4       22     30     34     4     ODV - 3 - 4 6 0200 - 3 0 1       30     40     43     4     ODV - 3 - 4 6 0340 - 3 0 1       37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1	_					
4     5     6.5     2     ODV - 3 - 2 6 0065 - 3 0 1       5.5     7.5     9     2     ODV - 3 - 2 6 0090 - 3 0 1       7.5     10     12     3     ODV - 3 - 2 6 0090 - 3 0 1       11     15     17     3     ODV - 3 - 3 6 0120 - 3 0 1       500-600V±10%     15     20     22     3       500-600V±10%     18.5     25     28     4       22     30     34     4     ODV - 3 - 4 6 0280 - 3 0 1       22     30     34     4     ODV - 3 - 4 6 0430 - 3 0 1       30     40     43     4     ODV - 3 - 4 6 0430 - 3 0 1       37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1		1.5	2	3.1	2	ODV - 3 - 2 6 0031 - 3 0 1 <mark>#</mark>
5.5     7.5     9     2     ODV - 3 - 2 6 0090 - 3 0 1       7.5     10     12     3     ODV - 3 - 2 6 0090 - 3 0 1       17.5     10     12     3     ODV - 3 - 3 6 0120 - 3 0 1       11     15     17     3     ODV - 3 - 3 6 0120 - 3 0 1       500-600V±10%     15     20     22     4     ODV - 3 - 4 6 0220 - 3 0 1       500-600V±10%     18.5     25     28     4     ODV - 3 - 4 6 0280 - 3 0 1       22     30     34     4     ODV - 3 - 4 6 0430 - 3 0 1     ODV - 3 - 4 6 0430 - 3 0 1       30     40     43     4     ODV - 3 - 5 6 0540 - 3 0 1     ODV - 3 - 5 6 0540 - 3 0 1						ODV - 3 - 2 6 0041 - 3 0 1 #
7.5     10     12     3     ODV - 3 - 3 6 0120 - 3 0 1       11     15     17     3     ODV - 3 - 3 6 0170 - 3 0 1       15     20     22     3     ODV - 3 - 3 6 0170 - 3 0 1       500-600V±10%     15     20     22     4     ODV - 3 - 3 6 0220 - 3 0 1       3 Phase Input     18.5     25     28     4     ODV - 3 - 4 6 0280 - 3 0 1       22     30     34     4     ODV - 3 - 4 6 0340 - 3 0 1     ODV - 3 - 4 6 0340 - 3 0 1       30     40     43     4     ODV - 3 - 5 6 0540 - 3 0 1     ODV - 3 - 5 6 0540 - 3 0 1						ODV - 3 - 2 6 0085 - 3 0 1 # ODV - 3 - 2 6 0090 - 3 0 1 #
15     20     22     3     ODV - 3 - 3 6 0220 - 3 0 1       500-600V±10%     15     20     22     4     ODV - 3 - 4 6 0220 - 3 0 1       3 Phase Input     18.5     25     28     4     ODV - 3 - 4 6 0220 - 3 0 1       22     30     34     4     ODV - 3 - 4 6 0340 - 3 0 1     ODV - 3 - 4 6 0340 - 3 0 1       30     40     43     4     ODV - 3 - 4 6 0430 - 3 0 1     ODV - 3 - 5 6 0540 - 3 0 1       37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1		7.5	10	12		ODV - 3 - 3 6 0120 - 3 0 1 <mark>#</mark>
500-600V±10%     15     20     22     4     ODV - 3 - 4 6 0220 - 3 0 1       3 Phase Input     18.5     25     28     4     ODV - 3 - 4 6 0280 - 3 0 1       22     30     34     4     ODV - 3 - 4 6 0340 - 3 0 1       30     40     43     4     ODV - 3 - 4 6 0430 - 3 0 1       37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1						ODV - 3 - 3 6 0170 - 3 0 1 # ODV - 3 - 3 6 0220 - 3 0 1 #
22     30     34     4     ODV - 3 - 4 6 0340 - 3 0 1       30     40     43     4     ODV - 3 - 4 6 0430 - 3 0 1       37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1						ODV - 3 - 4 6 0220 - 3 0 1 <mark>#</mark>
30     40     43     4     ODV - 3 - 4 6 0430 - 3 0 1       37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1	3 Phase Input					ODV - 3 - 4 6 0280 - 3 0 1 #
37     50     54     5     ODV - 3 - 5 6 0540 - 3 0 1						ODV - 3 - 4 6 0340 - 3 0 1 # ODV - 3 - 4 6 0430 - 3 0 1 #
		37	50	54	5	ODV - 3 - 5 6 0540 - 3 0 1 <mark>#</mark>
		45	60 75	65 79	5	ODV - 3 - 5 6 0650 - 3 0 1 #
						ODV - 3 - 6 6 0780 - 3 0 1 # ODV - 3 - 6 6 1050 - 3 0 1 #
90 125 130 6 ODV - 3 - 6 6 1300 - 3 0 1		90	125	130	6	ODV - 3 - 6 6 1300 - 3 0 1 # ODV - 3 - 6 6 1500 - 3 0 1 #

<b>IP20</b> Cabinet Mount	<b>IP55</b> TFT Display	Indoor <b>IP66</b> Non Switched	Indoor <b>IP66</b> with Disconnect	Outdoor <b>IP66</b> Non Switched	Outdoor <b>IP66</b> with Disconnect
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
0.1.01.1			D.T.I		5101
2-MN		X-TN X-TN	D-TN D-TN	A-MN A-MN	E-MN E-MN
2-MN 2-MN		X-TIN X-TIN	D-IN D-TN	A-MIN A-MN	E-MIN
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
				A-MN	E-MN
2-MN	N-MN				
2-MN	N-MN			A-MN	E-MN
2-MN	N-MN				
2-MN	N-MN				
2-MN	N-MN				
2-MN	N-MN				
2-////11	N-MN				
2-MN	14//44				
	N-MN				
2-MN					
	N-MN				
-	N-MN				
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
				A-MN	E-MN
2-MN		X-TN	D-TN		5101
2-MN 2-MN		X-TN X-TN	D-TN D-TN	A-MN A-MN	E-MN E-MN
2-///11		A-IIN	D-IIN	A-MN	E-MN
2-MN	N-MN			,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,	2774 4
2-MN	N-MN			A-MN	E-MN
2-MN	N-MN			A-MN	E-MN
2-MN	N-MN				
2-MN	N-MN				
2-MN	N-MN				
2-MN	N-MN				
Z-MIN	N-MN				
2-MN	1477014				
	N-MN				
2-MN					
2-MN					
	N-MN				
_	N-MN				
2-MN	N-MN				
2-MN					
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN 2-MN		X-TN X-TN	D-TN D-TN	A-MN A-MN	E-MN E-MN
2-MIN 2-MIN		X-TIN X-TIN	D-IN D-TN	A-MIN	E-MIN
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
2-MN		X-TN	D-TN	A-MN	E-MN
0.111	N111-1			A-MN	E-MN
2-MN	N-MN			A-MN	EAANI
2-MN 2-MN	N-MN N-MN			A-MN	E-MN E-MN
2-MIN 2-MIN	N-MN			A-MIN	E-MIN
2-MN	N-MN			7.170.3	E 7711 4
2-MN	N-MN				

Replace # in model code with enclosure/display option

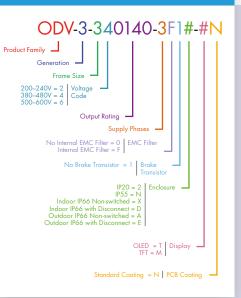


### **Drive Specification**

Input Ratings	Supply Voltage	200 - 240V ± 10% 380 - 480V ± 10% 500 - 600V ± 10%						
	Supply Frequency	48 – 62Hz						
	Displacement Power Factor	> 0.98						
	Phase Imbalance	3% Maximum allowed						
	Inrush Current	< rated currer	ıt					
	Power Cycles	120 per hour	maximum, evenly spaced					
Output Ratings	Output Power	230V 1Ph. Input: 0.75–2.2kW (1–3HP) 230V 3Ph. Input: 0.75–75kW (1–100HP) 400V 3Ph. Input: 0.75–250kW 460V 3Ph. Input: 1–350HP 575V 3Ph. Input: 0.75–110kW (1–150HP)						
	Overload Capacity	110% for 60 165% for 4 s	seconds econds					
	Output Frequency	0 – 250Hz, 0	.1Hz resolution					
	Typical Efficiency	> 98%		Ap				
Ambient Conditions	Temperature	Storage: -40 Operating: -	to 60°C 10 to 50°C	Fec				
	Altitude	Up to 1000m Up to 2000m	ASL without derating maximum UL approved maximum (non UL)					
	Humidity	95% Max, no	n condensing					
	Vibration	Conforms to E	N61800-5-1 2007, IEC 60068-2-6					
Enclosure	Ingress Protection	IP20, IP55, IP66						
Programming	Keypad	Built-in keypad as standard Optional remote mountable keypad						
	Display	Built-in multi le	anguage text display	Pur Fec				
	PC	OptiTools Stu	dio					
Control Specification	Control Method	Eco Sensorless Vector Open Loop Permanent Magnet Vector Open Loop BLDC Vector Open Loop Synchronous Reluctance Vector						
	PWM Frequency	4 – 32kHz Effective						
	Stopping Mode	Ramp to stop: User Adjustable 0.1–600 secs Coast to stop						
	Braking	AC Flux Braki	ng	& [				
	Skip Frequency	Single point, u	user adjustable					
	Setpoint Control	Analog Signal	0 to 10 Volts / 10 to 0 Volts -10 Volts to +10 Volts 0 to 20mA / 20 to 0mA 4 to 20mA / 20 to 4mA					
	Connor	Digital	Motorised Potentiometer (Keypad) Modbus RTU BACnet MS/TP					
Fieldbus Connectivity	Built-in	BACnet MS/TP	BACnet Application Specific Controller 9.6 - 76.8 kbps selectable Data Format: 8N1, 8N2, 8O1, 8E1	Sta Co				
		Modbus RTU	9.6 - 115.2 kbps selectable Data Format: 8N1, 8N2, 8O1, 8E1					
		BACnet/IP	Plug-in BACnet/IP interface Dual LAN ports Device Level Ring					
	Optional	Other	PROFIBUS DP (DPV1) PROFINET IO DeviceNet EtherNet/IP					

O pecification	Power Supply	24 Volt DC, 100mA, Short Circuit Protected 10 Volt DC, 10mA for Potentiometer							
	Programmable Inputs	5 Total as standard (optional additional 3) 3 Digital (optional additional 3) 2 Analog / Digital selectable							
	Digital Inputs	Opto - Isolated 8 – 30 Volt DC, internal or external supply Response time < 4ms							
	Analog Inputs	Resolution: 12 bits Response time: < 4ms Accuracy: < 1% full scale Parameter adjustable scaling and offset							
	PTC Input	Motor PTC / Thermistor Input Trip Level : $3k\Omega$							
	Programmable Outputs	2 Total 1 Analog / Digital 1 Relay							
	Relay Outputs	Maximum Voltage: 250 VAC, 30 VDC Switching Current Capacity: 5A							
	Analog Outputs	0 to 10 Volts / 10 to 0 Volts 0 to 20mA / 20 to 0mA 4 to 20mA / 20 to 4mA							
pplication atures	PID Control	Internal PID Controller Multi-setpoint Select Standby / Sleep Mode Boost Function							
	Fire Mode	Bidirectional Selectable Speed Setpoint (Fixed / PID / Analog / Fieldbus)							
	Load Monitoring	High Current Protection (Fan / Bump Blocked) Low Current Protection (Broken Belt / Shaft) Pump Blockage Detection with Cleaning							
	Duty / Assist / Standby	Built-in Multi-Pump Support Autotmatic Changeover on Fault Automatic Changeover on Time Fully Redundant							
ump Control actures	Pump Blockage Detection	Pump load monitoring with autotune function, user configurable							
	Pump Cleaning	Adjustable Bi-directional Pump Cleaning Cycle operation							
	Multi-Pump Control	Control of fixed speed assist pumps (with cascade control module) Control of Duty, Assist and Standby variable speed pumps via internal Master – Slave network							
	Pump Stir	Automatic pump stir to prevent sediment build-up							
laintenance Diagnostics	Fault Memory	Last 4 Trips stored with time stamp							
	Data Logging	Logging of data prior to trip for diagnostic purposes : Output Current Drive Temperature DC Bus Voltage							
	Maintenance Indicator	Maintenance Indicator with user adjustable maintenance interval Onboard service life monitoring							
	Monitoring	Hours Run Meter Resettable & Non-Resettable kWh meters Cooling Fan Run Time							
andards ompliance	Low Voltage Directive	2014/35/EU							
	EMC Directive	2014/30/EU							
	Additional Conformance	UL, cUL, EAC, RCM							
	Harmonic Currents	IEC61000-3-12							
	Environmental Conditions	Designed to meet IEC 60721-3-3, in operation: IP20 Drives: 3S2/3C2 IP55 & 66 Drives: 3S3/3C3							

### Model Code Guide



#### **Connection Diagram**

						Function	Default Setting
+24Vdc		0	1	+24V		24 Volt DC Output, 10	00mA max / 24 Volt DC Input
+24Vdc		0	2	DI 1		Digital Input 1	Drive Enable
		0	3	DI 2		Digital Input 2	Analog/Preset Speed 1 Select
Optional External		0	4	DI 3		Digital Input 3	Local/Remote Reference Select
Power		0	5	+10V		+10 Volt Power Supply	/ 5mA
Supply	•	0	6	DI 4/AI 1		Analog Input 1	Local Speed Reference
0Vdc	44	0	7	0V		0 Volt	
UVac	6	0	8	AO1		Analog Output 1	Motor Speed
	┝╨──┥	0	9	0V		0 Volt	
	4.	0	10	DI 5/AI 2		Analog Input 2	Remote Speed Reference
	<del>V</del>	0	11	AO2		Analog Output 2	Motor Current
	4	0	12	STO +		Safe Torque Off Input	
		0	13	STO -		Safe Torque Off Input	
		0	14	RL1-C	•		
		0	15	RL1-NO	•• ]	Output Relay 1	Drive Healthy / Fault
		Ø	16	RL1-NC	••		
		0 0	17 18	RL2-A RL2-B		Output Relay 2	Drive Running

	ot to sc/	ALE	Other	DeviceNe EtherNey EtherCAT Modbus 1	ΊP								B (1 str			
			IP20							IP66			IP55			
	Siz	e	2	3	4	5	6A	6B	8	2	3	4	4	5	6	7
m	m <b>Heig</b>	ht	221	261	418	486	614	726	995	257	310	360	450	540	865	1280
m	m Wid	th	110	131	160	222	286	330	482	188	211	240	171	235	330	330
m			185	205	240	260	320	320	480	186	235	271	252	270	330	360
k	g <b>Weig</b>	ht	1.8	3.5	10.4	19.9	42.5	43.5	112	3.5	6.6	9.5	12	23.1	55	89





### +44 (0)1938 556868

#### **Optidrive Eco Pump**

#### 🖌 Saving Energy / Reducing CO,

With large scale increases in global energy costs and the introduction of taxes and legislation relating to the industrial production of CO<sub>2</sub> gases the need to reduce energy consumption and save money has never been greater. Optidrive Eco Pump can be used with environmental sensors to reduce pump speed in pumping applications without compromising the required output of the system.

#### **Easy Installation**

Compact and modern design utilising the latest available technology have accumulated in a robust Eco Pump drive with small dimensions and innovative mounting and cabling features.

#### Simple Set-up & Rapid Commissioning

Optidrive Eco Pump was developed from concept for ease of use. A handful of parameters configure the drive for basic pump applications. A short, concise product data means the drive is running in seconds. Advanced powerful functionality is equally easily accessible.

#### Imaginative Enclosure Design

With a selection of IP55 and IP66 enclosures, Optidrive Eco Pump is well suited to harsh environments, or where cabinet and cabling costs need to be reduced.

#### Advanced Pump Control Functions

The key pump control functionality required for your application is inbuilt into Optidrive Eco Pump and packaged to be both quick and simple to activate. Added to this is the drive's own PLC programming flexibility that makes drive functionality virtually limitless.

#### ✓ Options for Flexibility

Optidrive Eco Pump combines both peripheral and factory built options to ensure you get the right drive, scaled to suit your application. With inbuilt BACnet and Modbus, and a host of communication options the Optidrive can integrate easily into your industrial network of choice.



Invertek Drives Ltd is dedicated to the design, manufacture and marketing of electronic variable speed drives. The state of the art UK headquarters houses specialist facilities for research & development, manufacturing and global marketing. The company pledges to implement and operate the ISO 14001 Environmental Management System to enhance environmental performance.

All company operations are accredited to the exacting customer focused ISO 9001:2008 quality standard. The company's products are sold globally in over 80 different countries. Invertek Drives' unique and innovative drives are designed for ease of use and meet with recognised international design standards.

#### **Global Pump Solutions**

Invertek Drives operate at the heart of pumping systems around the world





HOLLAND





IRELAND Maintaining pressure at pumping stations

ITALY Hot water pumping Cooling loop flow & across district network temperature control

AUSTRALIA Improved reliability & running costs



#### www.invertekdrives.com/pump-control

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