



# UNIDRIVE

## VARIABLE SPEED DRIVE CONTROL FOR COMPRESSOR INSTALLATIONS

### OPTIMISING CASCADED COMPRESSORS WITH UNIDRIVE VARIABLE SPEED DRIVE CONTROL

A dedicated drives partnership between EnerAir and Control Techniques, the UK's leading manufacturer of drives and systems, has added the unique multi-function Unidrive to the Enercon Energy Management System. The Unidrive used widely to reduce energy usage in the operation of fans and pumps. Similar operating conditions also mean that the Unidrive is the ideal VSD for use as the optimising element in compressed air applications, matching demand to supply in cascaded compressor operations.

### SIMPLICITY IN PRODUCT & SOFTWARE...POWERFUL IN CONTROL & COMMUNICATION

The Unidrive is renowned for its ease of commissioning and straightforward and quiet operation. It is also unique among drives for its control and communication abilities. The facility for a second processor via the plug-in UD70 module offers the user a cost effective "PLC-in the drive solution". The UD70 provides the Unidrive with real time control facilities and enables the drive to be integrated easily into any overall factory automation system. Unidrive is also well placed to exploit the integration possibilities provided by the continuing growth in fieldbus technology. A number of communications options, including Control Techniques own high speed bus CTNet, can be fitted to the UD70 to provide interfaces to all the most popularly used high speed bus networks in the market..

### UNIDRIVE AS A MODULAR ELEMENT IN THE ENERCON ENERGY MANAGEMENT SYSTEM

Significant efficiency gains will be achieved by retrofitting a Unidrive to a designated compressor in a bank of cascaded units. EnerAir overcomes problems experienced with retrofitting in the past with its VSD interface controller. Importantly, with this module fitted the compressor will remain standard and "believe" that it is running its own standard motor and regulating in Load/Unload mode. In addition, the VSD interface controller module enables the compressor motor control and safety circuits to remain intact and functional to original manufacturers specifications, and have priority over the VSD drive run operation.

The VSD controller module also interfaces (via an RS485 link) the Unidrive to the Enercon "S" series controller. The latter employs an enhanced efficiency single pressure band system and is also fully VSD compressor aware, meaning that it is capable of data-linking with the VSD compressor to form a coherent air compressor management system which acts in unison with all system resources to provide optimum efficiency at all times under all operating conditions.



## DRIVE SYSTEMS

The drive system includes:

- RFI filter\*
- Unidrive
- Semiconductor fuses (or mcb on smaller sizes) in the input
- VSD compressor interface controller and PWM to 4-20 mA loop converter
- Door mounted cooling fan as required (except 4kW unit)
- 3 control relays, one with a pneumatic timer
- 110 V control supply and protection for the relays and cooling fans
- 24 V AC supply and mcb protection for the VSD compressor interface controller
- MCB feed for the compressor auxiliaries
- View window for drive diagnostics
- Safety labelling

\*All variable speed drives emit energy in the radio frequency spectrum. European legislation has set limits on both the conducted and radiated emissions a drive can produce. These limits are more stringent when the equipment is operating close to, or sharing low voltage supplies, with domestic dwellings and certain other facilities such as hospitals. These environments are classified as the First Environment. Large industrial users of drives tend to work in the Second Environment ie under industrial conditions where they will not affect equipment operated by adjacent neighbours.

Drive systems quoted up to 30 kW have filters fitted suitable for operation in the First Environment; there is no cost benefit to move to a Second Environment solution. From 3/kW and above drives are quoted with a Second Environment Filter which typically gives a 90% attenuation across the spectrum under consideration.

Drive	kW	Current A
UNI1405L1	4kW	9.5 A
UNI2401L1	5.5 kW	12 A
UNI2402L1	7.5 kW	16 A
UNI2403L1	11kW	25 A
UNI3401L1	15 kW	34 A
UNI3402L1	18.5 kW	40 A
UNI3403L1	22 kW	46 A
UNI3404L1	30kW	60 A
UNI3405L1	37 kW	70 A
UNI4401L1	45 kW	96 A
UNI4402L1	55 kW	124 A
UNI4403L1	75 kW	156 A
UNI4404L1	90 kW	180 A
UNI4405L1	110 kW	202 A
UNI5401L1	150kW	300 A*
UNI5402L1	300 kW	600 A*
UNI5403L1	450 kW	900 A*
UNI5404L1	600 kW	1200 A*

## ADDITIONAL INFORMATION

- Panel colour Rittal standard RAL7032.
- Top cable entry
- Drives up to 11kW in a wall-mounted enclosure.
- 15kW drives and above in floor mounted enclosures
- Ambient temperature range assumed 0 to 38°C
- From start the drive will ramp up to set speed using it's own internal ramp; thereafter it will revert to following a 4-20 mA reference from the VSD compressor interface controller

## Panel Sizes



Drive	kW	Current	Dimensions (hwd) (mm)
UNI1405L1	4	9.5	500*500*250
UNI2401L1	5.5	12	800*600*250
UNI2402L1	7.5	16	800*600*250
UNI2403L1	11	25	800*600*250
UNI3401L1	15	34	1200*600*400
UNI3402L1	18.5	40	1200*600*400
UNI3403L1	22	46	1200*600*400
UNI3404L1	30	60	1200*600*400
UNI3405L1	37	70	1200*600*400
UNI4401L1	45	96	2000*800*500
UNI4402L1	55	124	2000*800*500
UNI4403L1	75	156	2000*800*500
UNI4404L1	90	180	2000*800*500
UNI4405L1	110	202	2000*800*500
UNI5401L1	150	300	2000*1000*600
UNI5402L1	300	600	2000*1200*600
UNI5403L1	450	900	2000*2000*600
UNI5404L1	600	1200	2000*2400*600

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