

Electromagnetic Toothed Clutch E330

Service Manual

P-2041-WE
SM310-gb-11/04



 **Warner**[®]
Electric

An Altra Industrial Motion Company

that the clutches made in our factories from St Barthélemy d'Anjou, and hereafter designated : **E330** are exclusively designed for incorporation into a machine and to be assembled with other equipments to create a machine. The operation of the product is submitted to the conformity of the complete equipment, following the provisions of the machinery directive 98/37/EC and if electric to the EMC directive 89/336 /EEC.

The conformity of the electric units to the Low Voltage directive 72/23 (modified) is supported by the full respect of the following standards : NFC 79300 and VDE 05808/8.65.

Drawn up in St Barthélemy d'Anjou, july 2002 E.

PRAT, General Managing Director

CONTENTS

1	Technical specifications	2	3.3.1	Installing VAR00/04	3
2	Precautions and restrictions on use	2	3.3.2	Installing VAR504	3
2.1	Restrictions on use	2	3.3.3	Installing VAR05	4
2.2	Precautions in use and safety measures	2	4	Maintenance	4
3	Installation	3	5	Electrical connection	4
3.1	Transport - storage	3	5.1	Important recommendations	4
3.2	Handling	3	5.2	Power supply	4
3.3	Installing	3	6	Appendix	5
			6.1	Drawings / Part numbers	5-6

1 Technical specifications

Size		50	100	200	400	800
N max.	min ⁻¹	4300	3600	3300	2600	2000
Travel Q	mm	1±0.1	1.1±0.1	1.2±0.1	1.3±0.1	1.3±0.1
Axial force on drive cup (350) (367)	N	300	450	650	1150	1800
Masse VAR04/14	kg	2.4	3.4	4.2	8	18
Coupling	-	28/38	38	42	55	75
Dimension E VAR05	mm	20+1.5/0	24+1.8/0	26+2/0	30+2.2/0	40+3/0
Weight VAR05	kg	3.6	6	8	17.2	35





Size		1600	3200	6400	12800
N max.	min ⁻¹	1800	1450	1200	1000
Travel Q	mm	2±0.1	2.3±0.1	2.7±0.1	3.2±0.1
Axial force on drive cup (350) (367)	N	3300	9000	15000	22000
Masse VAR04/14	kg	33.5	55.5	98	178
Coupling	-	90	110	140	-
Dimension E VAR05	mm	45+3.4/0	55+4.2/0	65+5/0	-
Weight VAR05	kg	61.5	108.3	170	-

NB: Data for catalogue equipment



Table 1

2 Precautions and restrictions on use

2.1 Restrictions on use

-  E330 clutches are designed for dry running (sealed bearings).
-  Exceeding the maximum rotation speeds stated in the catalogue invalidates the warranty.
-  The suitable ambient temperature for these units is max. 40°C (Insulation class of 155°C).
-  E330 clutches are designed for horizontal running

2.2 Precautions in use and safety measures

-  During maintenance, ensure that the machine's moving parts are stationary and that there is no risk of accidental start-up. All intervention have to be made by qualified personnel, owning this manual.
-  Any modification made to the brake without the express authorisation of a representative of Warner Electric, in the same way than any use out of the contractual specifications accepted by "Warner Electric", will result in the warranty being invalidated and Warner Electric will no longer be liable in any way with regard to conformity.

3 Installation

3.1 Transport / storage

Our clutches are supplied in packaging guaranteeing a preservation period of 6 months with land or air transport, or after transport by ship to neighbouring continents (without crossing the tropics).

3.2 Handling



Avoid any impacts on the equipment so as not to alter their performance.



Never carry the equipment by the electrical supply cable

3.3 Installing

E330 clutches are supplied reamed to tolerance H7 and splined to tolerance P9.

The toothed rim (350) is supplied reamed to tolerance H7. The toothed flange (367) (size 50 to 1600) is generally supplied in rough form and without fixing hole.

We recommend a tolerance h6 for the shaft and H7/f7 for the toothed rim (350) or toothed flange (367) centering.



Important: Do not forget to stop the inductor (101) rotating by means of a fixed part shaped in one of the slots.

Check the play between the inductor and this part;

0.5 minimum in rotation - 1 mm at base of slot

the part should not cause any strain on the bearings.

In case of vibrations, it is strongly recommended to insert a damping elastic slot between the anti-rotation device and the anti-rotation slot and to fix the coil's cable the nearest of it to avoid whipping.



In the case where two co-axial shafts are fitted, the recommended setover is 0,05 mm maximum.

The angular misalignment should not be greater than 0,1 mm over a length of 100 mm. If this is the case, use a VAR05 (flexible coupling).

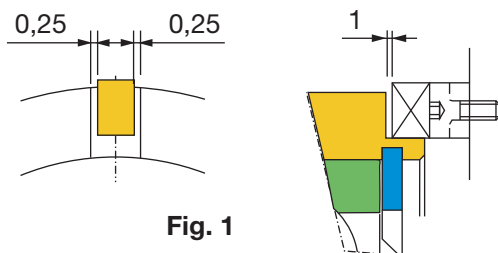


Fig. 1



Important: provide a lateral stop to take the axial thrust in engaged position (see table 1).

3.3.1 Installing VAR04

- Centre the toothed flange (367) or toothed rim (350) on the receiving part, then fix it by bolts and lock them

Do not forget to tighten to torque the fixing bolts for the moving toothed ring (352) or moving plate (353) and secure them with a Loctite 243 type or equivalent product.

- After adjusting the drive keyway, fit the assembled inductor onto the shaft and clamp it axially



It is essential when assembling the 2 parts to respect the travel Q (measured in engaged position - see table 1)

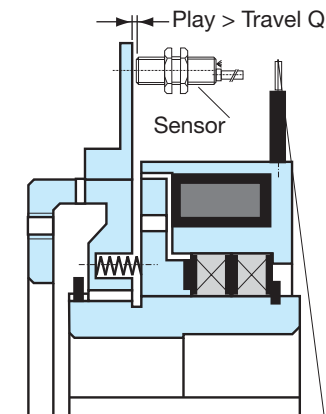
3.3.2 Installing VAR 504

Detection discs (aluminium or steel) compatible with inductive proximity sensor are provided with unit.

The position of the sensor should not obstruct the travel of the toothed flange (349) (351).


We suggest to use the inductive sensor (615) provided by our company, (see technical form).

MOUNTING EXAMPLE



3.3.3 Installing VAR05

- After adjusting the drive keyway, fit the assembled inductor onto the shaft, then the adjusting spacer, followed by the assembled bearing race, clamp the whole axially on the shaft

 From size 100, the coupling flange (528) is not factory fixed. After fitting the device on the shaft, fix this flange by means of the screws provided, tightened to torque (see table 2) and secured with a Loctite 243 type or equivalent product.


Size	50	100	200	400	800
Screws	-	M6	M6	M8	M8
Tightening torque (Nm)	-	9,1	9,1	22	22
	-	± 0,9	± 0,9	± 2,2	± 2,2

Size	1600	3200	6400	12800
Screws	M12	M16	M16	-
Tightening torque (Nm)	76	130	130	-
	± 7,5	± 13	± 13	-

Table 2

NB: VAR05 is supplied with a pre-set airgap, however, after fitting, check travel Q (measured in engaged position).

- Fit the coupling hub (507) onto the 2nd shaft and clamp it axially
- Put the spider (730) inside the coupling flange (528)
- Assemble the moving part with the receiving part by introducing the coupling hub teeth into the teeth hollows of the spider (730)

 It is essential when fitting to respect dimension E (fitting the flexible coupling - see table 1).


4 Maintenance


After a running time varying according to use, it may be necessary to change the bearings. For the inductor bearings, as the assembly is special, we recommend return to our factory for exchange.

5 Electrical connection

E330 units must be supplied with direct current (D.C) and are equipped with a 500 mm length wire. Polarity does not affect the functioning..

5.1 Important recommendations

 All works on the electrical connections have to be made with power off.

 Ensure compliance with the nominal supply voltage (inadequate supply causes a reduction in the starting distance and transmissible torque).

The connecting wires should be of sufficient diameter to prevent voltage drops between the source and equipment supplied.

I (A) / L (m)	0 to 10 m	from 10 to 20 m
0 to 3 (A)	1,5 mm ²	1,5 mm ²
3 to 6 (A)	1,5 mm ²	2,5 mm ²

Tolerance in the supply voltage to the clutch terminals +5% / -10% (NF C 79-300).

5.2 Power supply

For controlling these clutches, we advise the use of Warner Electric supply units.

Sizes 50 to 1600:

CBC 140-5

Sizes 6400 to 12800:

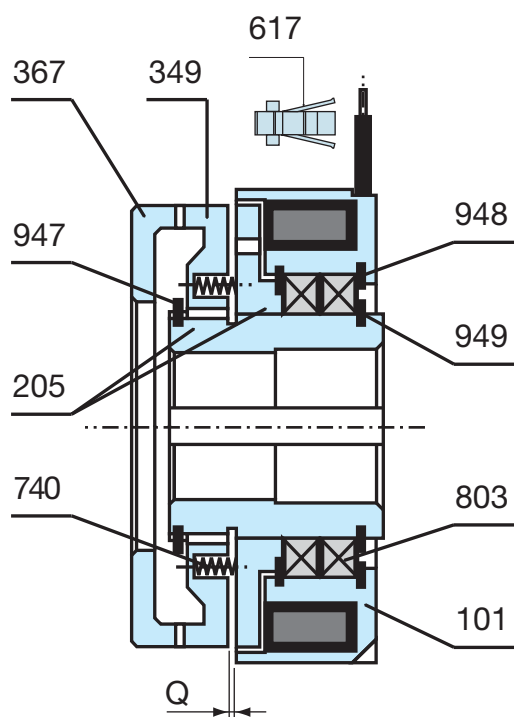
Ask us.

Warner Electric supply units provide protection for coils and circuits. Where a clutch is used without our supply units, with switching on the DC, it is essential for the coil to be protected against surges by a varistor

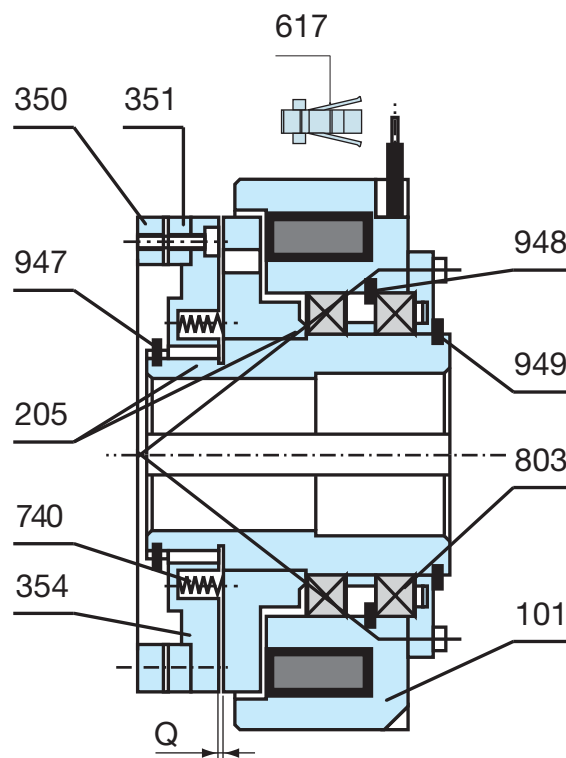
6 Appendix

6.1 Drawings / Part numbers

Sizes 50 to 1600

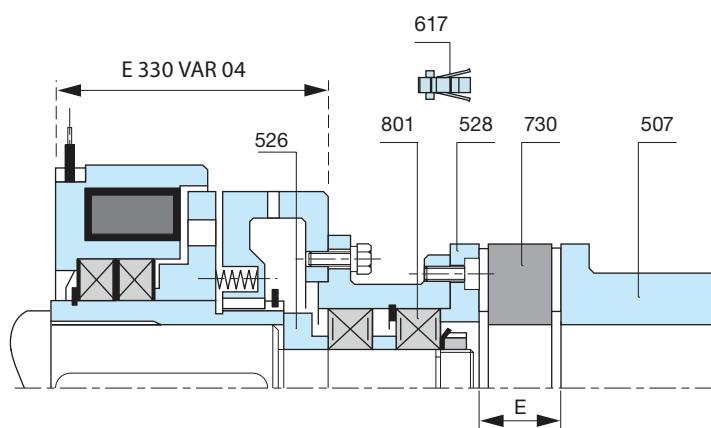


Sizes 3200 to 12800

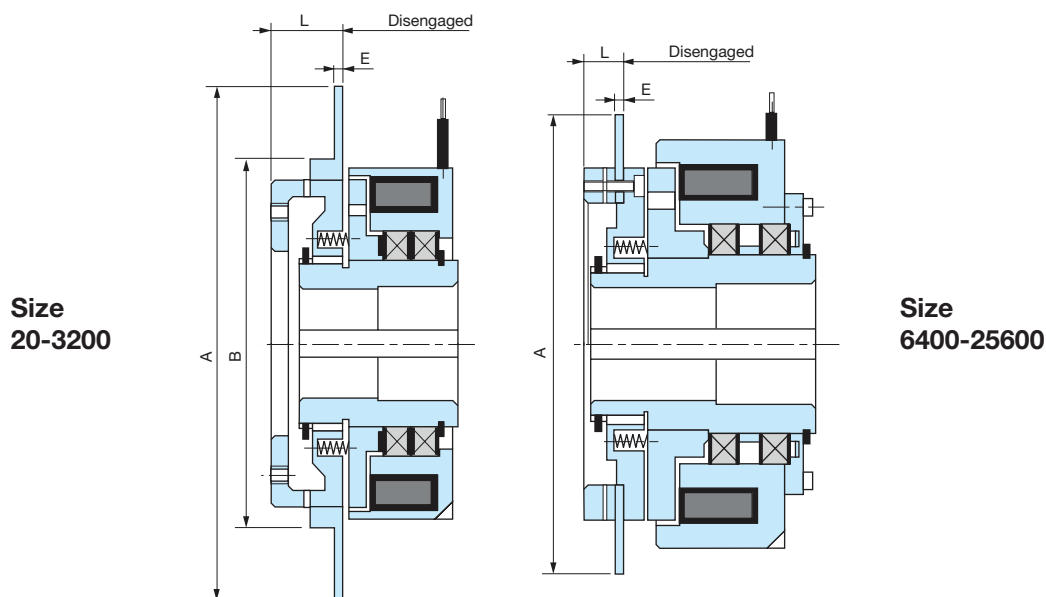


Nr	Description
101	Magnet
205	Assembled rotor
349	Moving toothed ring
350	Bronze toothed rim
351	Steel toothed rim
367	Toothed flange
507	Coupling hub
526	Adjusting spacer
528	Coupling flange
615	Inductive proximity sensor
617	Connector kit (Option)
730	Spider
740	Spring
801	Ball bearings
803	Centering ball bearing
947	Outside circlips
948	Inside retainer
949	Outside retainer

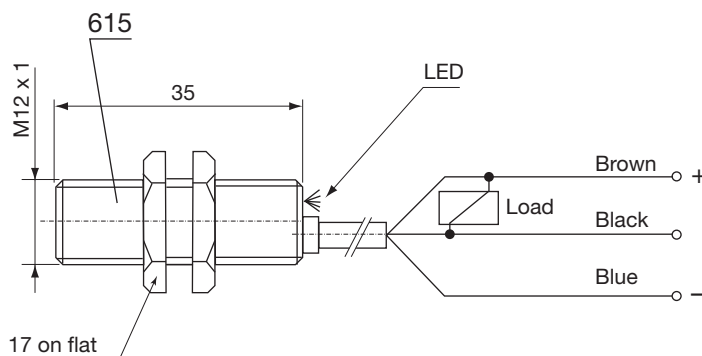
VAR05



6.1 Drawings VAR504



INDUCTIVE PROXIMITY SENSOR



Sizes	50	100	200	400	800	1600	3200	6400	12800
A	152	168	178	205	250	300	344	400	465
B	104	120	132	158	205	245	-	-	-
E	3	3	3	3	3	3	4	5	5
L	23	23	24,5	32	37	53	42,5	48	62

CHARACTERISTICS

Rate operating distance (steel target)	2 mm	Reverse battery protection	yes
Monting	shilded	Wire break resistance	yes
Switching element function	Normally open	EMC	Group A
Cable	NPN, 3 x 0,34 mm ² , 2 m	Operating frequency	2000 Hz
Usable supply voltage	18 V... 30 VDC	Hysteresis	≤ 15 %
Ripple voltage	≤ 10 %	Temperature drift	≤ 10 %
No load supply voltage	≤ 10 mA	Repeat accuracy	≤ 10 %
Rated operational current	120 mA	Housing	Nickel-plated brass
Voltage drop	≤ 1,5 V	Front cap	PBTP
Off-state current	≤ 10 μA	Degree of protection (EN 60529)	IP 67
Short circuit protection	yes	Ambiant air temperature	-25°C... +70°C
Overload protection	yes		

Warranty

Warner Electric LLC warrants that it will repair or replace (whichever it deems advisable) any product manufactured and sold by it which proves to be defective in material or workmanship within a period of one (1) year from the date of original purchase for consumer, commercial or industrial use.

This warranty extends only to the original purchaser and is not transferable or assignable without Warner Electric LLC's prior consent.

Warranty service can be obtained in the U.S.A. by returning any defective product, transportation charges prepaid, to the appropriate Warner Electric LLC factory. Additional warranty information may be obtained by writing the Customer Satisfaction Department, Warner Electric LLC, 449 Gardner Street, South Beloit, Illinois 61080, or by calling 815-389-3771.

A purchase receipt or other proof of original purchase will be required before warranty service is rendered. If found defective under the terms of this warranty, repair or replacement will be made, without charge, together with a refund for transportation costs. If found not to be defective, you will be notified and, with your consent, the item will be repaired or replaced and returned to you at your expense.

This warranty covers normal use and does not cover damage or defect which results from alteration, accident, neglect, or improper installation, operation, or maintenance.

Some states do not allow limitation on how long an implied warranty lasts, so the above limitation may not apply to you.

Warner Electric LLC's obligation under this warranty is limited to the repair or replacement of the defective product and in no event shall Warner Electric LLC be liable for consequential, indirect, or incidental damages of any kind incurred by reason of the manufacture, sale or use of any defective product. Warner Electric LLC neither assumes nor authorizes any other person to give any other warranty or to assume any other obligation or liability on its behalf.

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