File E337848
Project 10CA17517

Date

REPORT

On

COMPONENT – CONTROLLERS, REFRIGERATION

Shanghai Thermo Ecotech Co., Ltd
Shanghai, China

DESCRIPTION

PRODUCT COVERED:

USR, CNR Component – Pressure Operated Limiting type Switch, Series YK-A, YK-B, YK-C, YK-D.

GENERAL:

These devices are automatic reset pressure operated switches, intended to control refrigeration equipment, oil pump, air pump and other industrial pressure protect system. The controllers are open type with provisions for electrical connections. The control includes a pressure-sensing element in a SPST switch configuration to open or close the electrical circuit through variation in pressure.

RATINGS:

Series	Volt.	Freq. Hz	A, Resistive	FLA	LRA	Contact Type	Set Point Pressure	Cycles	Note
YK-A, YK-C	36 Vdc	-	3	-	-	Normally opened	10~700 psig	100,000	Limiting Type
	120 Vac	50/60	-	6	34.8				
	240 Vac	50/60	-	3	17.4				
YK-B, YK-D	36 Vdc	-	3	-	-	Normally closed	10~700 psig	100,000	Limiting Type
	120 Vac	50/60	-	6	34.8				
	240 Vac	50/60	-	3	17.4				

Rated Ambient Temperature: 65°C.

NOMENCLATURE:

YK-A	-	700/500	-	T2
I		II		III

I: Model Series Name

II: Set Point Pressure & Reset Pressure (In no particular order):

Minimum 10 psig to maximum 700 psig

III: Connecting Tube Type, refer to ILL.1 for detail

ENGINEERING CONSIDERATIONS (NOT FOR FIELD REPRESENTATIVE'S USE):

Use - For use only in complete equipment where the acceptability of the combination is determined by Underwriters Laboratories Inc.

USR indicates investigation to the Standard for Temperature-Indicating and -Regulating Equipment, UL 873, Twelfth Edition.

CNR indicated investigation to the Standard for Temperature-Indicating and Regulating Equipment, CSA C22.2 No. 24-93, Eighth Edition.

Conditions of Acceptability - When installed in the end-use equipment, the following are among the considerations to be made.

1. The device shall be installed in compliance with the enclosure, mounting, spacing, and segregation requirements of the ultimate application.

2. This component has been judged on the basis of the required spacings in the Standard for Temperature-Indicating and Regulating Equipment (UL 873), Table 32.1, Column D; And CSA C22.2 No. 24, Canadian Standard for Temperature Indicating and Regulating Equipment, Table 3, Column D, which covers the end-use products for which this component was designed.

3. The quick-connect style terminals have not been evaluated for field connection. The acceptability of the terminals and connections to these terminals, including temperature and secureness, shall be determined in the end-use application.

4. Terminals may be set at any angle as long as spacings are met. Terminal orientation should be described in the end-use product Report to maintain spacings, if critical.

5. The mounting means shall be evaluated in the end-use application.

6. The effects of potentially corrosive fluids on the device have not been determined.

7. Suitability of use with fluids lower than normal ambient (25°C) or higher than rated ambient (65°C), shall be determined in the end-use application.

8. The pressure-operated switches have been tested for a maximum hydrostatic pressure of 4 times their rated pressure for 1 minute.

CONSTRUCTION DETAILS:

The product shall be constructed in accordance with the following description.

Markings - Recognized Company name, UL file number, trace name or trademark and model or catalog designation. See Section General for trademark. Electrical ratings are optional.

Date of Manufacture Marking - For CNR products, month and year of manufacture provided. Coding or serial numbers acceptable.

Corrosion Protection – All ferrous metal parts are protected from corrosion by painting, plating, enameling, or galvanizing.

Tolerances - Unless specified otherwise, all indicated dimensions are nominal.

Spacings –

Line-voltage - Spacings are provided between (a) bare live parts and grounded or exposed dead-metal parts, (b) bare live parts of opposite polarity or of separate circuits, and (c) bare line- and low-voltage parts:

		Spacings, in. (mm)		
Component or Circuit	V	Through Air (T.A.)	Over Surface (O.S.)	To Enclosure, T.A, O.S.
(Appliance)	0-300	1/8 (3.2)	1/4 (6.4)	1/4 (6.4)

Same Polarity - Spacings provided between live-metal parts on opposing sides of a switching mechanism, except at contacts/switching element:

Application	Location	T.A. in. (mm)	O.S. in. (mm)
Regulating Control	Except at terminals	1/32 (0.8)	3/64 (1.2)
Limiting Control	Except at terminals	1/32 (0.8)	1/16 (1.6)

PRESSURE OPERATURED SWITCH, SERIES YK-A - FIG. 1 AND 2

General – FIG. 1 shows overview and FIG. 2 shows disassembly view of Series YK-A. See also ILL.1.

1. Base - R/C (QMFZ2), E I DUPONT DE NEMOURS & CO INC (E41938), Type L496, rated V-0, 120°C. Measured overall 22 mm OD by 25 mm high, 1 mm thick.

2. Potting Compound - R/C (QMFZ2), SUZHOU POCHELY ELECTRONIC MATERIAL CO LTD (E304947), type HB-5225A/B, rated V-0, 90°C. Filling up the spacing between Base and Frame.

3. Moveable Contact Arm - Copper alloy, overall measured 6.2 by 6.7 by 10.5 mm long, 0.8 mm thick. Secured to the Moveable Arm Support by riveting.

4. Moveable Arm Support - Nickel plated brass, overall measured 6.4 by 11 by 2.7 mm high, 0.8 mm thick. Secured to one of the Slice by riveting.

5. Cover - R/C (QMFZ2), E I DUPONT DE NEMOURS & CO INC (E41938), Type L496, rated V-0, 120°C. Measured overall 16.8 mm OD by 5 mm high, 0.8 mm thick. Provided with a 2 mm ID hole for the Adjusting Pole. Secured to the Frame by Ultrasonic welding.

6. Adjusting Pole – Ceramic. Overall 2 mm OD by 5.7 mm long. Physical fit the hole of the Cover and sandwiched between Moveable Contact Arm and the Snap Disk.

7. Snap Disk - Ni-Cr stainless steel. Overall 21 mm diameter by 0.1 mm thick. Flexes in the opposite direction when operating pressure is reached. Number of disks varies with pressure rating. Sandwiched between the Flat Board and Pressure Cabin. (Not showed in Fig. 2)

8. Pressure Cabin – Ni-Cr stainless steel. Overall 21 mm OD by 3.3 mm high, 0.9 mm thick. Provided with an 11 mm ID hole for Connecting Tube. Secured to the Base by pressure fit.

9. Flat Board - Ni-Cr stainless steel. Overall 21 mm OD by 3.3 mm high, 0.9 mm thick. Provided with a 5 mm ID hole for Adjusting Pole. Secured to the Fix Ring by pressure fit.

10. Connecting Tube – Copper. Type 1/4F, refer to ILL.1 for dimension. Provided for connection to pressure system. Welded to the Pressure Cabin.

Alternate – Same as above except for Type 1/4M.
Alternate – Same as above except for Type 1/8M.
Alternate – Same as above except for Type T1.
Alternate – Same as above except for Type T2.
Alternate – Same as above except for Type T3.
Alternate – Same as above except for Type T4.
Alternate – Same as above except for Type Standard 10 mm fitting.

11. Fix Ring - Ni-Cr stainless steel. Overall 21 mm OD by 21 mm ID by 3.5 mm high, 0.3 mm thick. Sandwiched between the Flat Board and Base.

12. Frame - R/C (QMFZ2), E I DUPONT DE NEMOURS & CO INC (E41938), Type L496, rated V-0, 120°C. Overall 17 mm OD by 10 mm high, 1 mm thick. Secured to the Flat Board by the Fix Ring.

13. Slice – Two provided. Nickel plated brass. "L" shape, each overall 4.8 by 5 by 5 mm wide, 0.8 mm thick. Provided with a 2.7 by 1 mm wide hole for Moveable Arm Support/Stationary Contact Support. Welded to the Lead Wires.

14. Stationary Contact Support - Nickel plated brass. Overall 4.3 by 6.3 by 5 mm wide, 0.8 mm thick. Secured to one of the Slice by riveting.

15. Stationary Contact – AgNi10 (90% of Ag and 10% of Ni), copper base. Overall measured 3 mm OD by 1.9 mm high, 0.6 mm thick at contact head, min. 0.2 mm thick for AgNi10 plating at contacting end. Secured to the Stationary Contact Support by riveting.

16. Movable Contact - AgNi10 (90% of Ag and 10% of Ni), copper base. Overall measured 3 mm OD by 1.3 mm high, 0.6 mm thick at contact head, min. 0.2 mm thick for AgNi10 plating at contacting end. Secured to the Movable Contact Arm by riveting.

17. Lead Wire – Two provided. R/C (AVLV2/8) 300V, 105°C, VW-1, 18 AWG. Each one mechanically secured to the Slice before soldering.

PRESSURE OPERATURED SWITCH, Series YK-B - FIG. 3

General – FIG. 3 shows the disassembly of Series YK-B. See Ill. 1 for the exploded picture. Series YK-B is same as Series YK-A, except as following items:

14. Stationary Contact Support - Nickel plated brass. Overall 4.3 by 9 by 5 mm wide, 0.8 mm thick. Secured to one of the Slice by riveting.

PRESSURE OPERATURED SWITCH, Series YK-C - FIG. 4

General – FIG. 4 shows the disassembly of Series YK-C. See Ill. 1 for the exploded picture. Series YK-C is same as Series YK-A, except as following items:

1. Base - R/C (QMFZ2/8), E I DUPONT DE NEMOURS & CO INC (E41938), Type L496, rated V-0, 120°C. Measured overall 23 mm OD by 20 mm high, 1 mm thick.

4. Moveable Arm Support - Nickel plated brass, overall measured 8.3 by 11 by 2.7 mm high, 0.8 mm thick. Secured to one of the Slice by riveting.

13. Slice (Terminal) – Two provided. Brass. “L” shape, each overall 6.4 by 17 by 4.2 mm wide, 0.8 mm thick. Provided with a 2.7 by 1 mm wide hole for Moveable Arm Support/Stationary Contact Support. Provided with quick connector, integrated with a 6.3 mm wide by 0.8 mm thick tab. Welded to the Terminals.

14. Stationary Contact Support - Nickel plated brass. Overall 4.3 by 8.3 by 5 mm wide, 0.8 mm thick. Secured to one of the Slice by riveting.

17. Lead Wire – Not Provided.

PRESSURE OPERATURED SWITCH, Series YK-D - FIG. 5

General – FIG. 5 shows the disassembly of Series YK-D. See Ill. 1 for the exploded picture. Series YK-D is same as Series YK-A, except as following items:

1. Base - R/C (QMFZ2), E I DUPONT DE NEMOURS & CO INC (E41938), Type L496, rated V-0, 120°C. Measured overall 23 mm OD by 20 mm high, 1 mm thick.

4. Moveable Arm Support - Nickel plated brass, overall measured 8.3 by 11 by 2.7 mm high, 0.8 mm thick. Secured to one of the Slice by riveting.

13. Slice (Terminal)– Two provided. Brass. “L” shape, each overall 6.4 by 17 by 4.2 mm wide, 0.8 mm thick. Provided with a 2.7 by 1 mm wide hole for Moveable Arm Support/Stationary Contact Support. Provided with quick connector, integrated with a 6.3 mm wide by 0.8 mm thick tab. Welded to the Terminals.

14. Stationary Contact Support - Nickel plated brass. Overall 4.3 by 11 by 5 mm wide, 0.8 mm thick. Secured to one of the Slice by riveting.

17. Lead Wire – Not Provided.