Crane Control Class 9055

Catalog

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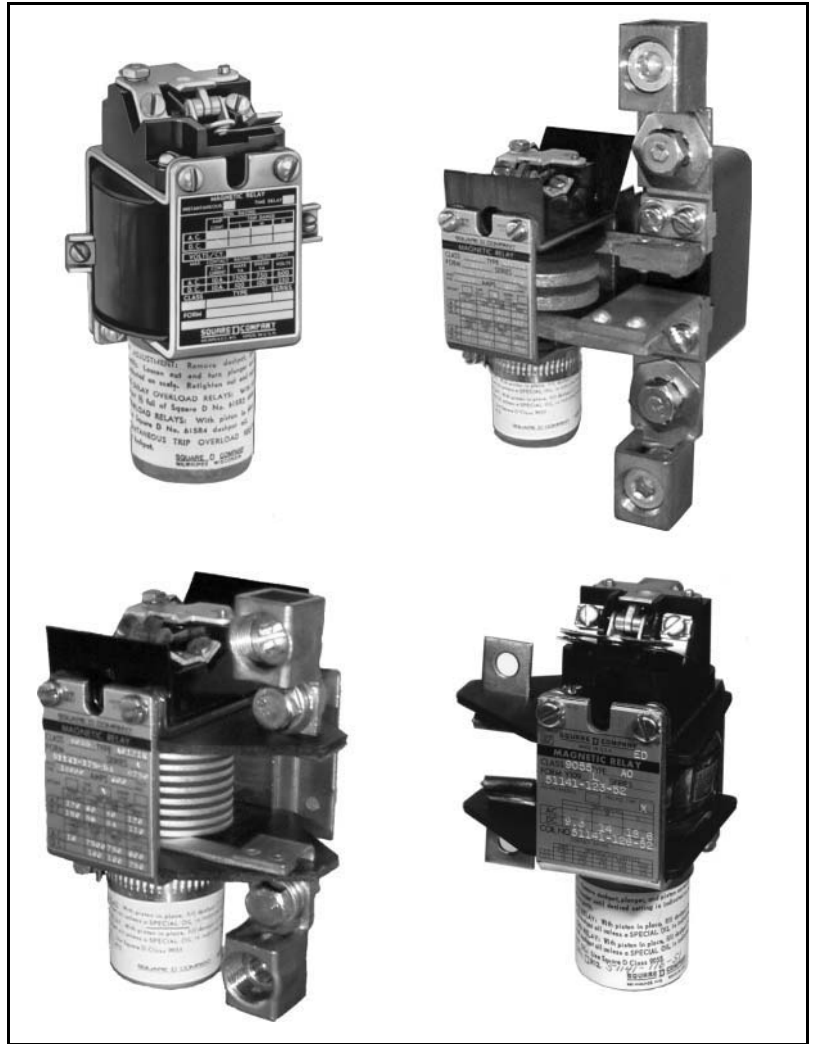
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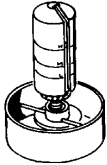
The Electric Controller and
Manufacturing Company, LLC

Crane Control Class 9055
Magnetic Current Overload Relays

Type AO101-AO116

Type A
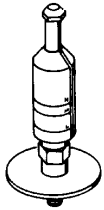
Type N

Type AO117-AO121

Type AO122-AO126

Type AO167-AO176

APPLICATION DATA

General

All Class 9055 magnetic current relays use the same basic frame. This frame supports a contact mechanism on the top and a dashpot on the bottom. When the relay picks up, a plunger is drawn upward into the coil until it stops against an insulated trip pin which operates a set of contacts.

The distance the plunger travels is adjustable by means of threading the plunger up or down on a threaded stud. Changing the distance between the pole piece and the plunger affects the current at which the relay will pick up. Relays are designed to be adjustable over a 2 to 1 range.

Coils range from tapewound versions with many turns of insulated wire to one with a single turn of bare copper busbar. In the lower current ranges, up to a continuous current of 20 amperes AC, coils are all tapewound with self-supporting terminals one on each side of coil (See AO101-AO116).

In higher current ranges, coils are designed either to have their terminals supported by insulating washers standing free of the mounting panel (See AO117-AO121 and AO122-AO126), or to have their terminals flush with the mounting surface of the relay so that they can be bolted onto an insulating panel and wired from the back of the panel (See AO167-AO176).

Inverse Time Delay Type A

A time delay which decreases in proportion to the amount of overcurrent is provided by means of a piston attached to the plunger which is submerged in oil in the dashpot. When the current through the coil becomes sufficient to pick up the plunger, the motion of the plunger is retarded while the oil flows around the piston as it moves towards the top of the dashpot. This time delay can be adjusted by changing the rate of flow of the oil through and around the piston. This is done by rotating a disk in the bottom of the piston so that one or more holes of various diameters are uncovered. The piston is equipped with a 1-way ball valve which opens when the piston drops through the oil so that drop out is almost instantaneous.

Several types of dashpot oil are available for these relays with different viscosities to produce different tripping times.

Type A relays are used to provide motor running overcurrent protection in applications where exceptionally long time delays are required or exceptionally high currents are encountered. Once the Type A relay has tripped, current must be reduced to a very low value before reset occurs.

Standard devices are supplied with a single normally closed contact which opens on increasing current and closes automatically when the current goes to zero.

Instantaneous Trip Type N

Type N relays do not have a piston on the end of the plunger and do not use dashpot oil. The bottom of the piston is equipped with a disc which guides the piston within the dashpot to maintain its vertical position.

Standard devices are equipped with a single normally closed contact which opens upon increasing current. Contacts reset automatically at approximately 80% of the trip current setting on AC, and approximately 67% on DC.

Instantaneous trip relays are normally used in applications where mechanical overloads are expected to occur with relative frequency or where motor circuits need to be protected from brief overload currents in excess of those detected by motor running overcurrent protection.

Application Data

Magnetic Current Relays, particularly in the lower current ranges, have a relatively high impedance. Because of this, a minimum horsepower rating of 1 1/2 HP is recommended for 3-phase motors and 1/2 HP for 1-phase motors. This recommendation is made to avoid the possibility of excessive voltage drop across the magnetic current relay which could interfere with the operation of the motor.

For Crane Control Applications:
Inverse time delay Type A relays are typically set @ 125% of motor full load current.
Instantaneous trip Type N relays are typically set @ 200% of motor full load current.

GENERAL INFORMATION AND PRICING

Maximum Continuous Current		Trip Current Adjustment Range Auto or Hand Reset		Type A ◆		
				Open Type ●		
AC	DC	AC	DC	Steel Panel Mounting Type	Insulating Panel Mounting Type	Price
0.38	0.47	0.19-0.38	0.18-0.35	AO101		
0.48	0.60	0.24-0.48	0.23-0.45	AO102		
0.54	0.67	0.27-0.54	0.25-0.50	AO103		
0.70	0.87	0.35-0.70	0.32-0.64	AO104		
0.74	0.92	0.37-0.74	0.34-0.68	AO105		
1.04	1.30	0.52-1.04	0.48-0.96	AO106		
1.4	1.75	0.7-1.4	0.65-1.3	AO107		
2.0	2.5	1.0-2.0	0.93-1.8	AO108		
3.2	4.0	1.6-3.2	1.5-3.0	AO109		
4.0	5.0	2.0-4.0	1.8-3.7	AO110		
4.8	6.0	2.4-4.8	2.2-4.5	AO111		
7.0	8.7	3.5-7.0	3.3-6.5	AO112		
8.0	10.0	4.0-8.0	3.7-7.5	AO113		
10	12.5	5.0-10.0	4.7-9.3	AO114		
12	15	6.0-12.0	5.6-11.1	AO115		
20	25	10.0-20.0	9.3-18.6	AO116		
32	40	16.0-32.0	15.0-30.0	AO117R	AO167R	
48	60	24.0-48.0	22.0-45.0	AO118R	AO168R	
60	75	30.0-60.0	28.0-56.0	AO119R	AO169R	
80	100	40.0-80.0	37.0-75.0	AO120R	AO170R	
120	150	60.0-120.0	56.0-110.0	AO121R	AO171R	
160	200	80.0-160.0	75.0-150.0	AO122R	AO172R	
210	260	107.0-210.0	100.0-195.0	AO123R	AO173R	
320	400	160.0-320.0	150.0-300.0	AO124R	AO174R	
420	525	210.0-420.0	200.0-400.0	AO125R	AO175R ▲	
640	800	320.0-640.0	300.0-600.0	AO126R	AO176R ▲	

Maximum Continuous Current ■		Trip Current Adjustment Range Auto Reset ■		Trip Current Adjustment Range Hand Reset ■		Type N		
						Open Type ●		
AC	DC	AC	DC	AC	DC	Steel Panel Mounting Type	Insulating Panel Mounting Type	Price
0.38	0.47	0.26-0.54	0.27-0.60	0.17-0.34	0.21-0.41	NO101		
0.48	0.60	0.33-0.69	0.35-0.76	0.22-0.44	0.26-0.53	NO102		
0.54	0.67	0.36-0.76	0.38-0.84	0.24-0.48	0.29-0.58	NO103		
0.70	0.87	0.47-0.98	0.5-1.1	0.31-0.62	0.38-0.75	NO104		
0.74	0.92	0.5-1.1	0.53-1.2	0.33-0.65	0.4-0.8	NO105		
1.04	1.30	0.7-1.5	0.75-1.6	0.46-0.92	0.56-1.12	NO106		
1.4	1.75	0.9-2.0	1.0-2.2	0.62-1.24	0.75-1.5	NO107		
2.0	2.5	1.4-2.9	1.5-3.1	0.9-1.8	1.1-2.2	NO108		
3.2	4.0	2.2-4.6	2.3-5.0	1.45-2.9	1.75-3.5	NO109		
4.0	5.0	2.8-5.8	2.9-6.2	1.8-3.6	2.2-4.4	NO110		
4.8	6.0	3.3-7.0	3.5-7.5	2.1-4.3	2.6-5.2	NO111		
7.0	8.7	4.8-10.0	5.0-11.0	3.1-6.2	3.8-7.6	NO112		
8.0	10.0	5.6-11.6	5.8-12.4	3.6-7.2	4.4-8.8	NO113		
10	12.5	7.0-14.5	7.3-15.5	4.5-9.0	5.4-10.8	NO114		
12	15	8.4-17.5	8.8-18.7	5.4-10.8	6.5-13.0	NO115		
20	25	14.0-29.0	15.0-32.0	9.0-18.0	11.0-22.0	NO116		
32	40	23.0-47.0	24.0-50.0	14.0-29.0	18.0-35.0	NO117R	NO167R	
48	60	34.0-69.0	35.0-74.0	21.0-43.0	26.0-52.0	NO118R	NO168R	
60	75	40.0-83.0	42.0-92.0	26.0-52.0	32.0-64.0	NO119R	NO169R	
80	100	56.0-117.0	59.0-125.0	36.0-72.0	44.0-88.0	NO120R	NO170R	
120	150	82.0-170.0	85.0-182.0	52.0-104.0	64.0-128.0	NO121R	NO171R	
160	200	110.0-220.0	115.0-230.0	72.0-144.0	88.0-176.0	NO122R	NO172R	
210	260	147.0-286.0	152.0-292.0	96.0-192.0	117.0-234.0	NO123R	NO173R	
320	400	230.0-470.0	230.0-540.0	144.0-287.0	175.0-350.0	NO124R	NO174R	
420	525	290.0-610.0	308.0-674.0	191.0-383.0	233.0-466.0	NO125R	NO175R ▲	
640	800	435.0-915.0	480.0-950.0	287.0-575.0	350.0-700.0	NO126R	NO176R ▲	

● Relays rated 32 A and above (A, or NO 117R and higher) have both coil terminals on the right hand side as standard. Relays with right hand coil terminals can be field converted to the left hand side. Relays with left hand coil terminals can be ordered from the factory by changing the "R" in the type number to "L". Example: Class 9055 Type NO 117L.

▲ DC continuous ratings shown for these relays apply when coil terminals are front connected with suitable lugs. When back connected, DC ratings of Types 175 and 176 are 420 and 640 A, respectively.

■ These relays should normally be adjusted to trip at a current value less than the listed maximum continuous current. In special applications requiring the use of a higher trip setting, care should be taken that the coil is not subjected to current in excess of its maximum continuous rating for any prolonged period.

◆ For crane applications use Type C2U dashpot oil and dashpot locking strap 750D107G1.

Ordering Information Required:

1. Class   2. Type   3. Form   4. Current setting (AC or DC)

SCH	B

PRICING INFORMATION AND APPLICATION DATA

Maximum Current Ratings for Control Circuit Contacts

Relay Type	Contact Arrangement	AC								DC			
			Inductive 35% Power Factor					Resistive 75% P.F.			Inductive and Resistive		
		Volts	Make		Break		Cont. A	Make, Break and Cont. A	Volts	Make and Break		Cont. A
			A	VA	A	VA				A	VA	
A, N	(Standard) or (Form Y44)	120	60	7200	6	720	10	10	125	0.8	100	10
		240	30	7200	3	720	10	10	250	0.4	100	10
		480	15	7200	1.5	720	10	10	...	...	...	...
		600	12	7200	1.2	720	10	10	...	...	...	...

Maximum coil voltage all types 600 VAC 60Hz or 600 VDC.

Additional Dashpot Oil (Order by Class 9055 and Type Number)

1 oz Bottle (Sufficient for one relay)		1 Pint Container	
Type	Price	Type	Price ★
C2U ●		C2P ●	
R2U ▲		R2P ▲	
R1OU		R1OP	
R11U		R11P	

▲ Supplied as standard with type A relays.
● Recommended for crane applications.

Recommended Minimum Horsepower Ratings
To avoid excessive voltage drop, which may be encountered when using these magnetic relays with small motors, the following minimum horsepowers are recommended.

Motor Type	Minimum HP
3-Phase	1-1/2
1-Phase	1/2

Factory Modifications and Forms

Class 9055 Magnetic Current Relays

Description of Special Features	Form Letters	Price Addition (Per Relay) ★		
		Type A	Type B	Type N
		List Price	List Price	List Price
Hand Reset: On open type relay	H3		...	
Substitute normally-open contact for normally-closed.	Y44		...	
Double break contacts	Y45		...	

Accessories

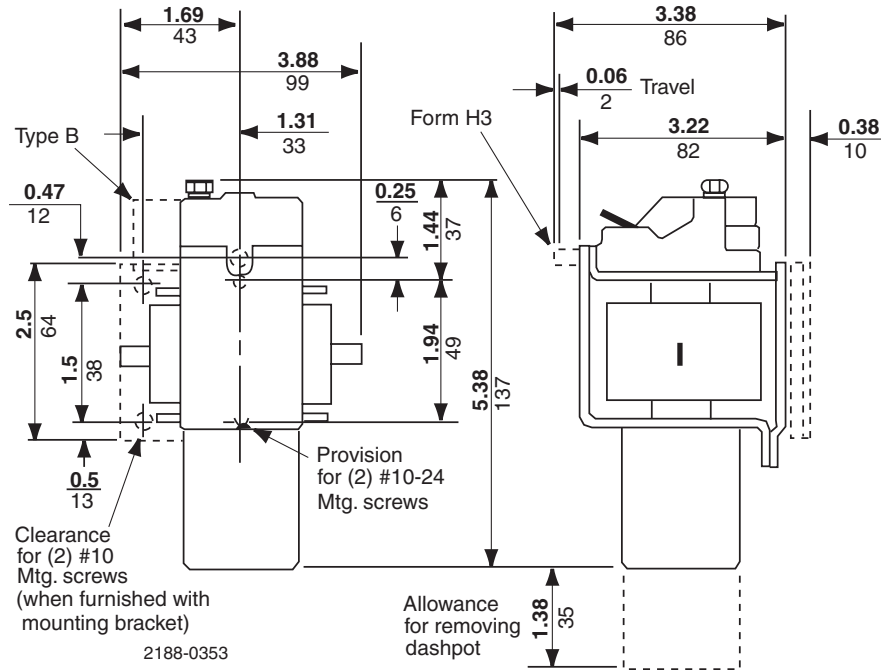| Description	Part Number	Price ◊
Dashpot locking strap. (Recommended on all crane applications or when subject to vibration.)	750D107G1	
Mounting Bracket (Allows Types 101 thru 121 to be mounted from the front of panel)	750X103	

★ = Disc Sch B
◊ = Disc Sch C

SCH	B,C

DISCOUNT SCHEDULES B,C

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APPROXIMATE DIMENSIONS AND WEIGHTS

2188-0353

Types AO101 thru 116, 191 thru 116

Weight – 4 lb (1.8 kg)

2188-0354
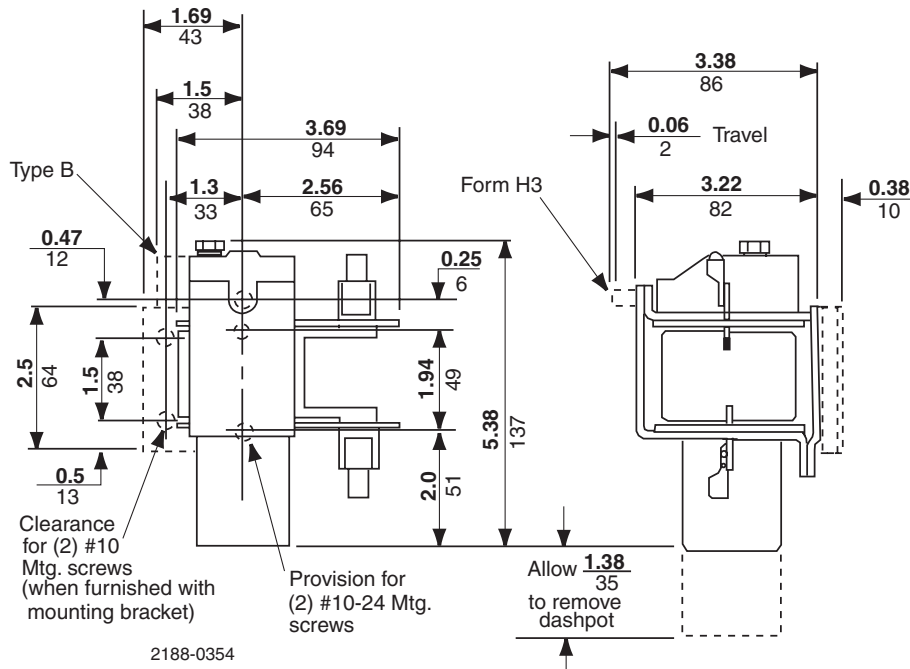
Types AO117R thru 121R, 117R thru 121R
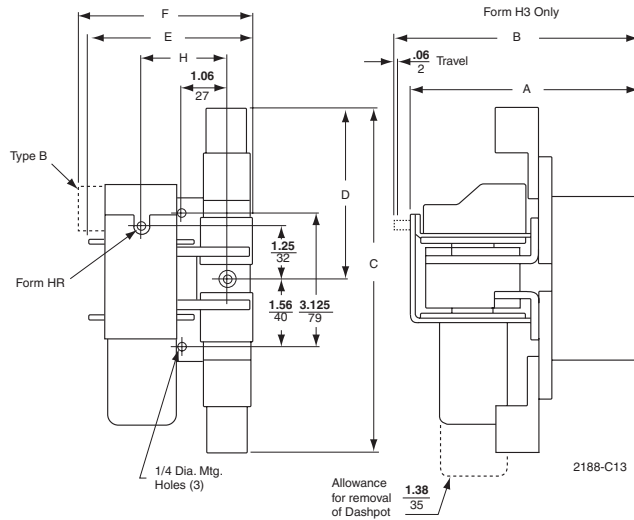
Weight – 4 lbs (1.8 kg)

NOTE: Only right hand versions are shown. Dimensions also apply to left hand versions, except that all parts are assembled opposite to position shown. Dimensions to left and right of vertical centerline, therefore would be reversed.
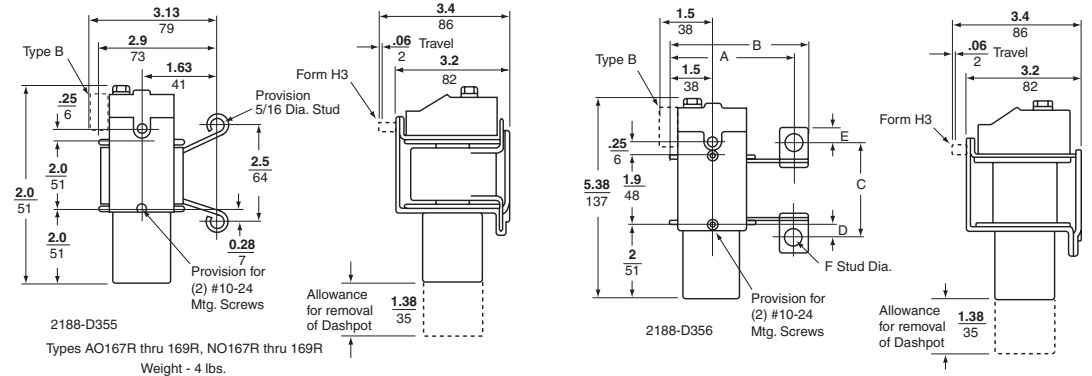
Crane Control Class 9055
Magnetic Current Overload Relays

APPROXIMATE DIMENSIONS AND WEIGHTS

Type ▲	Dimension								Shipping Weight lbs (kg)
	A	B	C	D	E	F	G	H	
AO122R	**5.41** 137	**5.59** 142	**8.38** 213	**4.19** 106	**3.81** 97	...	**0.56** 14	**2.0** 51	5 (2.3)
NO122R	**5.41** 137	**5.59** 142	**8.38** 213	**4.19** 106	**3.81** 97	...	**0.56** 14	**2.0** 51	5 (2.3)
AO123R	**5.41** 137	**5.59** 142	**8.38** 213	**4.19** 106	**3.81** 97	...	**0.56** 14	**2.0** 51	5 (2.3)
NO123R	**5.41** 137	**5.59** 142	**8.38** 213	**4.19** 106	**3.81** 97	...	**0.56** 14	**2.0** 51	5 (2.3)
AO124R	**5.38** 137	**5.59** 142	**9.5** 241	**4.75** 121	**4.19** 106	...	**0.94** 24	**2.0** 51	6 (2.7)
NO124R	**5.38** 137	**5.59** 142	**9.5** 241	**4.75** 121	**4.19** 106	...	**0.94** 24	**2.0** 51	6 (2.7)
AO125R	**5.63** 143	**5.84** 148	**9.5** 241	**4.75** 121	**4.19** 106	...	**0.94** 24	**2.0** 51	6 (2.7)
NO125R	**5.63** 143	**5.84** 148	**9.5** 241	**4.75** 121	**4.19** 106	...	**0.94** 24	**2.0** 51	6 (2.7)
AO126R	**5.88** 149	**6.06** 154	**13.69** 348	**6.84** 174	**4.94** 125	...	**1.19** 30	**2.5** 54	8 (3.6)
NO126R	**5.88** 149	**6.06** 154	**13.69** 348	**6.84** 174	**4.94** 125	...	**1.19** 30	**2.5** 54	8 (3.6)

2188-D355

Types AO167R thru 169R, NO167R thru 169R
Weight - 4 lbs.

2188-D356

Type ▲	Dimension						Shipping Weight lb (kg)
	A	B	C	D	E	F	
AO170R THRU 173R	**2.88** 73	**3.25** 83	**2.5** 64	**0.28** 7	**0.38** 10	**0.38** 10	4 (1.8)
NO170R THRU 173R	**2.88** 73	**3.25** 83	**2.5** 64	**0.28** 7	**0.38** 10	**0.38** 10	4 (1.8)
AO174R, NO174R	**3.25** 83	**3.88** 98	**3.0** 76	**0.53** 13	**0.56** 14	**0.5** 13	5 (2.3)
AO175R, NO175R	**3.25** 83	**3.88** 98	**5.0** 127	**0.53** 13	**0.56** 14	**0.5** 13	5 (2.3)
AO176R, NO176R	**3.75** 95	**4.5** 114	**5.0** 127	**1.53** 39	**1.25** 32	**0.75** 19	5 (2.3)

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