



## DASHPOT TYPE MAGNETIC CURRENT RELAYS Underload Trip Type

### APPLICATION

Overload relay with short time delay for motor overload protection or for load monitoring applications requiring detection of an overload and/or underload condition.

### CHARACTERISTICS AND CONSTRUCTION

1. Inverse time trip characteristics.
2. Adjustable trip current setting.
3. Short trip time — adjustable.
4. The same relay may be used for ac or dc applications with trip current adjustment range as listed.
5. Automatic reset. (Hand reset not available.) Relay resets at 88-90% of ac trip current setting, 80-85% of dc trip current setting.
6. Contacts are single pole, double throw (one N.O., one N.C.) with maximum ac pilot duty ratings of 480 volts, 7200 VA make, 720 VA break. Resistive load rating 15 amperes ac. Contacts not suitable for dc use.
7. Relays supplied with dashpot oil.
8. For steel or insulating panel mounting.
9. Relays having a maximum continuous rating of 20 amperes ac or less are provided with one terminal on each side of coil.
10. Relays having a maximum continuous rating of 32 amperes ac or more are provided with both terminals on left side of coil (e.g. Type BO-124L), or with both terminals on right side of coil (e.g. Type BO-124R). Devices with right hand coil terminals are considered standard by the factory.

600 VOLTS MAX. AC†				0-60 HERTZ†				250 VOLTS MAX. DC†					
Maximum Continuous Current		Trip Current Adjustment Range Auto Reset		Open Type — Suitable for Steel Panel Mounting or Insulating Panel Mounting		General Purpose Enclosure NEMA Type 1							
						Price	One Relay	Price	Two Relays	Price	Three Relays	Price	
AC	DC	AC	DC										
.38	.47	.19-.38	.18-.35	BO-101	\$ 32.	BG-101	\$ 44.	BG-201	\$ 82.	BG-301	\$129.		
.48	.60	.24-.48	.23-.45	BO-102	32.	BG-102	44.	BG-202	82.	BG-302	129.		
.54	.67	.27-.54	.25-.50	BO-103	32.	BG-103	44.	BG-203	82.	BG-303	129.		
.70	.87	.35-.70	.32-.64	BO-104	32.	BG-104	44.	BG-204	82.	BG-304	129.		
.74	.92	.37-.74	.34-.68	BO-105	32.	BG-105	44.	BG-205	82.	BG-305	129.		
1.04	1.30	.52-1.04	.48-.96	BO-106	32.	BG-106	44.	BG-206	82.	BG-306	129.		
1.4	1.75	.7-1.4	.65-1.3	BO-107	32.	BG-107	44.	BG-207	82.	BG-307	129.		
2.0	2.5	1.0-2.0	.93-1.8	BO-108	32.	BG-108	44.	BG-208	82.	BG-308	129.		
3.2	4.0	1.6-3.2	1.5-3.0	BO-109	32.	BG-109	44.	BG-209	82.	BG-309	129.		
4.0	5.0	2.0-4.0	1.8-3.7	BO-110	32.	BG-110	44.	BG-210	82.	BG-310	129.		
4.8	6.0	2.4-4.8	2.2-4.5	BO-111	32.	BG-111	44.	BG-211	82.	BG-311	129.		
7.0	8.7	3.5-7.0	3.3-6.5	BO-112	32.	BG-112	44.	BG-212	82.	BG-312	129.		
8.0	10.0	4.0-8.0	3.7-7.5	BO-113	32.	BG-113	44.	BG-213	82.	BG-313	129.		
10.	12.5	5.0-10.	4.7-9.3	BO-114	32.	BG-114	44.	BG-214	82.	BG-314	129.		
12.	15.	6-12.	5.6-11.1	BO-115	32.	BG-115	44.	BG-215	82.	BG-315	129.		
20.	25.	10.-20.	9.3-18.6	BO-116	32.	BG-116	44.	BG-216	82.	BG-316	129.		

Maximum Continuous Current		Trip Current Adjustment Range Auto Reset		Open Type for Steel Panel Mounting		Open Type for Insulating Panel Mounting		General Purpose Enclosure NEMA Type 1							
				L.H. *	R.H. *	L.H. *	R.H. *	Price	One Relay	Price	Two Relays	Price	Three Relays	Price	
AC	DC	AC	DC												
32	40	16-32.	15-30.	BO-117L	BO-117R	BO-167L	BO-167R	\$ 32.	BG-117	\$ 44.	BG-217	\$ 82.	BG-317	\$129.	
48	60	24-48.	22-45.	BO-118L	BO-118R	BO-168L	BO-168R	32.	BG-118	44.	BG-218	82.	BG-318	129.	
60	75	30-60.	28-56.	BO-119L	BO-119R	BO-169L	BO-169R	32.	BG-119	44.	BG-219	82.	BG-319	129.	
80	100	40-80.	37-75.	BO-120L	BO-120R	BO-170L	BO-170R	35.	BG-120	47.	BG-220	89.	BG-320	140.	
120	150	60-120	56-110.	BO-121L	BO-121R	BO-171L	BO-171R	35.	BG-121	47.	BG-221	89.	BG-321	140.	
160	200	80-160	75-150.	BO-122L	BO-122R	BO-172L	BO-172R	47.	BG-122	59.	BG-222	106.	BG-322	167.	
210	260	107-210	100-195.	BO-123L	BO-123R	BO-173L	BO-173R	47.	BG-123	59.	BG-223	106.	BG-323	167.	
320	400	160-320	150-300.	BO-124L	BO-124R	BO-174L	BO-174R	50.	BG-124	62.	BG-224	113.	BG-324	176.	
420	525	210-420	200-400.	BO-125L	BO-125R	BO-175L ‡	BO-175R ‡	64.	BG-125	76.	BG-225	141.	BG-325	218.	
640	800	320-640	300-600.	BO-126L	BO-126R	BO-176L ‡	BO-176R ‡	78.	BG-126	96.	BG-226	186.	BG-326	278.	

\*See explanation of left hand and right hand coil terminals above.  
 ‡DC continuous current ratings shown for these relays apply when coil terminals are front connected with suitable lugs. When back connected, dc ratings of Types BO-175 and BO-176 are 420 and 640 amperes respectively.  
 † These ratings apply to power circuit only — contact rating is 480 volts ac maximum, no dc rating.

### ORDERING INFORMATION REQUIRED

- 1—Specify class and type number.
- 2—Specify Form Y93 if a specific trip setting is desired and whether ac or dc. (If not specified, relay will be set to trip at mid-point of range. See Special Features table on page 4).
- 3—Specify special features desired. (See page 4 for list of special features available.)



## DASHPOT TYPE MAGNETIC CURRENT RELAYS

### Time Delay or Instantaneous Trip Overload and Underload Relays

ADDITIONS, MODIFICATIONS AND SPECIAL FEATURES	Form Letters	Price Addition (Per Relay)		
		Type A	Type B	Type N
Hand reset:				
On open type relay.....	HR	\$ 2.50	.....	\$ 2.50
On enclosed relay (Internal reset button is standard).....	HR	2.50	.....	2.50
On enclosed relay — external reset button.....	HR Y65	7.50	.....	7.50
Substitute normally open contact for normally closed.....	Y44	N.C.	.....	N.C.
Add mounting bracket 750-X103 (Types 101 thru 121 only)▲.....	Y66	N.C.	N.C.	N.C.
Set trip point at factory (specify ampere setting and whether ac or dc).....	Y93	3.00	3.00	3.00
Add strap 750-D107-G1 to lock dashpot in place (Supplied as standard on Type N. Recommended on all Types when subject to vibration.).....	Y10	N.C.	N.C.	Std.
Substitute silicone dashpot oil to provide more accurate tripping time under varying ambient temperature:				
For normal acceleration time (Type A relay) specify Type R11 oil.....		1.00	.....	.....
For long time acceleration (Type A relay) specify Type R10 oil (When long accelerating time is involved, a trip setting below midpoint of the range is recommended).....		1.00	.....	.....
For Type B relay specify Type R12 oil.....		.....	1.00	.....

▲Types 101 thru 121 are provided as standard with two tapped holes to accept mounting screws inserted from rear of panel. Bracket allows mounting screws to be inserted from front of panel. (See Class 9055 Dimension Sheets.)

#### •ADDITIONAL DASHPOT OIL (Order by Class and Type Number)

OIL STOCK NUMBER (Do not use this number for ordering purposes.)	1 Oz. Bottle Sufficient for One Relay		1 Pint Container		1 Quart Container		1 Gallon Container	
	Class 9055 Type	Price	Class 9055 Type	Price	Class 9055 Type	Price	Class 9055 Type	Price
1615-000020 (formerly 615-R2)★	R2U	\$ .30	R2P	\$ 1.70	R2Q	\$ 2.50	R2G	\$ 6.60
1615-000040 (formerly 615-R4)‡	R4U	.30	R4P	1.70	R4Q	2.50	R4G	6.60
1615-000060 (formerly 615-R10)	R10U	1.30	R10P	18.00	R10Q	30.00	R10G	95.00
1615-000080 (formerly 615-R11)	R11U	1.30	R11P	18.00	R11Q	30.00	R11G	95.00
1615-000090 (formerly 615-R12)	R12U	1.30	R12P	18.00	R12Q	30.00	R12G	95.00

★ Supplied as standard with Type A relays.  
‡ Supplied as standard with Type B relays.

#### RECOMMENDED MINIMUM HORSEPOWER

(To avoid excessive voltage drop which may be encountered when using these magnetic current relays with small motors the following minimum hp are recommended).

Motor Type	Minimum Hp
3-Phase	1½
1-Phase	½



## DASHPOT TYPE MAGNETIC CURRENT RELAYS

### Time Delay Trip Type

#### APPLICATION

Time delay type overload relay for motor overload protection.

#### CHARACTERISTICS AND CONSTRUCTION

1. Inverse time trip characteristics.
2. Adjustable trip current setting.
3. Adjustable trip time setting.
4. The same relay may be used for ac or dc applications with trip current adjustment range as listed.
5. Automatic reset. Hand reset (Form HR) also available.
6. Contact is normally closed, single pole, single throw with maximum pilot duty ratings of 750 VA, 600 V. ac and 100 VA, 250 V. dc. Continuous rating 10 amperes. Normally open, single pole, single throw contact also available (Form Y44).
7. Relays supplied with dashpot oil.
8. For steel panel or insulating panel mounting.
9. Relays having a maximum continuous rating of 20 amperes ac or less are provided with one terminal on each side of coil.
10. Relays having a maximum continuous rating of 32 amperes ac or more are provided with both terminals on left side of coil (e.g. Type AO-118L), or with both terminals on right side of coil (e.g. Type AO-118R). Devices with right hand coil terminals are considered standard by the factory.

600 VOLTS MAX. AC				0-60 CYCLES				250 VOLTS MAX. DC					
Maximum Continuous Current		Trip Current Adjustment Range Auto or Hand Reset		Open Type — Suitable for Steel Panel Mounting or Insulating Panel Mounting				General Purpose Enclosure NEMA Type 1					
								Price	One Relay	Price	Two Relays	Price	Three Relays
AC	DC	AC	DC										
.38	.47	.19-.38	.18-.35	AO-101		\$ 22.	AG-101	\$ 34.	AG-201	\$ 62.	AG-301	\$ 99.	
.48	.60	.24-.48	.23-.45	AO-102		22.	AG-102	34.	AG-202	62.	AG-302	99.	
.54	.67	.27-.54	.25-.50	AO-103		22.	AG-103	34.	AG-203	62.	AG-303	99.	
.70	.87	.35-.70	.32-.64	AO-104		22.	AG-104	34.	AG-204	62.	AG-304	99.	
.74	.92	.37-.74	.34-.68	AO-105		22.	AG-105	34.	AG-205	62.	AG-305	99.	
1.04	1.30	.52-1.04	.48-.96	AO-106		22.	AG-106	34.	AG-206	62.	AG-306	99.	
1.4	1.75	.7-1.4	.65-1.3	AO-107		22.	AG-107	34.	AG-207	62.	AG-307	99.	
2.0	2.5	1.0-2.0	.93-1.8	AO-108		22.	AG-108	34.	AG-208	62.	AG-308	99.	
3.2	4.0	1.6-3.2	1.5-3.0	AO-109		22.	AG-109	34.	AG-209	62.	AG-309	99.	
4.0	5.0	2.0-4.0	1.8-3.7	AO-110		22.	AG-110	34.	AG-210	62.	AG-310	99.	
4.8	6.0	2.4-4.8	2.2-4.5	AO-111		22.	AG-111	34.	AG-211	62.	AG-311	99.	
7.0	8.7	3.5-7.0	3.3-6.5	AO-112		22.	AG-112	34.	AG-212	62.	AG-312	99.	
8.0	10.0	4.0-8.0	3.7-7.5	AO-113		22.	AG-113	34.	AG-213	62.	AG-313	99.	
10.	12.5	5.0-10.	4.7-9.3	AO-114		22.	AG-114	34.	AG-214	62.	AG-314	99.	
12.	15.	6.-12.	5.6-11.1	AO-115		22.	AG-115	34.	AG-215	62.	AG-315	99.	
20.	25.	10.-20.	9.3-18.6	AO-116		22.	AG-116	34.	AG-216	62.	AG-316	99.	

Maximum Continuous Current		Trip Current Adjustment Range Auto or Hand Reset		Open Type for Steel Panel Mounting		Open Type for Insulating Panel Mounting		Price	General Purpose Enclosure NEMA Type 1					
				L.H. *	R.H. *	L.H. *	R.H. *		One Relay	Price	Two Relays	Price	Three Relays	Price
AC	DC	AC	DC											
32	40	16.-32.	15.-30.	AO-117L	AO-117R	AO-167L	AO-167R	\$ 22.	AG-117	\$ 34.	AG-217	\$ 62.	AG-317	\$ 99.
48	60	24.-48.	22.-45.	AO-118L	AO-118R	AO-168L	AO-168R	22.	AG-118	34.	AG-218	62.	AG-318	99.
60	75	30.-60.	28.-56.	AO-119L	AO-119R	AO-169L	AO-169R	22.	AG-119	34.	AG-219	62.	AG-319	99.
80	100	40.-80.	37.-75.	AO-120L	AO-120R	AO-170L	AO-170R	25.	AG-120	37.	AG-220	69.	AG-320	110.
120	150	60.-120.	56.-110.	AO-121L	AO-121R	AO-171L	AO-171R	25.	AG-121	37.	AG-221	69.	AG-321	110.
160	200	80.-160.	75.-150.	AO-122L	AO-122R	AO-172L	AO-172R	37.	AG-122	49.	AG-222	86.	AG-322	137.
210	260	107.-210.	100.-195.	AO-123L	AO-123R	AO-173L	AO-173R	37.	AG-123	49.	AG-223	86.	AG-323	137.
320	400	160.-320.	150.-300.	AO-124L	AO-124R	AO-174L	AO-174R	40.	AG-124	52.	AG-224	93.	AG-324	146.
420	525	210.-420.	200.-400.	AO-125L	AO-125R	AO-175L ‡	AO-175R ‡	54.	AG-125	66.	AG-225	121.	AG-325	188.
640	800	320.-640.	300.-600.	AO-126L	AO-126R	AO-176L ‡	AO-176R ‡	68.	AG-126	86.	AG-226	166.	AG-326	248.

\*See explanation of left hand and right hand coil terminals above.  
 ‡DC continuous ratings shown for these relays apply when coil terminals are front connected with suitable lugs. When back connected, dc ratings of Types AO-175 and AO-176 are 420 and 640 amperes respectively.

#### ORDERING INFORMATION REQUIRED

- 1—Specify Class and Type number.
- 2—Specify Form Y93 if a specific trip setting is desired and whether ac or dc. (If not specified, relay will be set to trip at mid-point of range. See Special Features table on page 4.)
- 3—Specify special features desired. (See page 4 for list of special features available.)

General Price Revision.

**SQUARE D COMPANY**

●Revised

Prices Subject to Change without Notice.

**SCHEDULE DS-1 DISCOUNTS**





## DASHPOT TYPE MAGNETIC CURRENT RELAYS Underload Trip Type

### APPLICATION

Overload relay with short time delay for motor overload protection or for load monitoring applications requiring detection of an overload and/or underload condition.

### CHARACTERISTICS AND CONSTRUCTION

- Inverse time trip characteristics.
- Adjustable trip current setting.
- Short trip time — adjustable.
- The same relay may be used for ac or dc applications with trip current adjustment range as listed.
- Automatic reset. (Hand reset not available.) Relay resets at 88-90% of ac trip current setting, 80-85% of dc trip current setting.
- Contacts are single pole, double throw (one N.O., one N.C.) with maximum ac pilot duty ratings of 480 volts, 7200 VA make, 720 VA break. Resistive load rating 15 amperes ac. Contacts not suitable for dc use.
- Relays supplied with dashpot oil.
- For steel or insulating panel mounting.
- Relays having a maximum continuous rating of 20 amperes ac or less are provided with one terminal on each side of coil.
- Relays having a maximum continuous rating of 32 amperes ac or more are provided with both terminals on left side of coil (e.g. Type BO-124L), or with both terminals on right side of coil (e.g. Type BO-124R). Devices with right hand coil terminals are considered standard by the factory.

600 VOLTS MAX. AC†				0-60 HERTZ†				250 VOLTS MAX. DC†					
Maximum Continuous Current		Trip Current Adjustment Range Auto Reset		Open Type — Suitable for Steel Panel Mounting or Insulating Panel Mounting				General Purpose Enclosure NEMA Type 1					
AC	DC	AC	DC	Price				One Relay	Price	Two Relays	Price	Three Relays	Price
.38	.47	.19-	.38	.18-	.35	BO-101	\$ 32.	BG-101	\$ 44.	BG-201	\$ 82.	BG-301	\$129.
.48	.60	.24-	.48	.23-	.45	BO-102	32.	BG-102	44.	BG-202	82.	BG-302	129.
.54	.67	.27-	.54	.25-	.50	BO-103	32.	BG-103	44.	BG-203	82.	BG-303	129.
.70	.87	.35-	.70	.32-	.64	BO-104	32.	BG-104	44.	BG-204	82.	BG-304	129.
.74	.92	.37-	.74	.34-	.68	BO-105	32.	BG-105	44.	BG-205	82.	BG-305	129.
1.04	1.30	.52-	1.04	.48-	.96	BO-106	32.	BG-106	44.	BG-206	82.	BG-306	129.
1.4	1.75	.7-	1.4	.65-	1.3	BO-107	32.	BG-107	44.	BG-207	82.	BG-307	129.
2.0	2.5	1.0-	2.0	.93-	1.8	BO-108	32.	BG-108	44.	BG-208	82.	BG-308	129.
3.2	4.0	1.6-	3.2	1.5-	3.0	BO-109	32.	BG-109	44.	BG-209	82.	BG-309	129.
4.0	5.0	2.0-	4.0	1.8-	3.7	BO-110	32.	BG-110	44.	BG-210	82.	BG-310	129.
4.8	6.0	2.4-	4.8	2.2-	4.5	BO-111	32.	BG-111	44.	BG-211	82.	BG-311	129.
7.0	8.7	3.5-	7.0	3.3-	6.5	BO-112	32.	BG-112	44.	BG-212	82.	BG-312	129.
8.0	10.0	4.0-	8.0	3.7-	7.5	BO-113	32.	BG-113	44.	BG-213	82.	BG-313	129.
10.	12.5	5.0-	10.	4.7-	9.3	BO-114	32.	BG-114	44.	BG-214	82.	BG-314	129.
12.	15.	6.-	12.	5.6-	11.1	BO-115	32.	BG-115	44.	BG-215	82.	BG-315	129.
20.	25.	10.-	20.	9.3-	18.6	BO-116	32.	BG-116	44.	BG-216	82.	BG-316	129.

Maximum Continuous Current		Trip Current Adjustment Range Auto Reset		Open Type for Steel Panel Mounting		Open Type for Insulating Panel Mounting		General Purpose Enclosure NEMA Type 1							
AC	DC	AC	DC	L.H. *	R.H. *	L.H. *	R.H. *	Price	One Relay	Price	Two Relays	Price	Three Relays	Price	
32	40	16-	32	15-	30	BO-117L	BO-117R	BO-167L	BO-167R	\$ 32.	BG-117	\$ 44.	BG-217	\$ 82.	BG-317
48	60	24-	48	22-	45	BO-118L	BO-118R	BO-168L	BO-168R	32.	BG-118	44.	BG-218	82.	BG-318
60	75	30-	60	28-	56	BO-119L	BO-119R	BO-169L	BO-169R	32.	BG-119	44.	BG-219	82.	BG-319
80	100	40-	80	37-	75	BO-120L	BO-120R	BO-170L	BO-170R	35.	BG-120	47.	BG-220	89.	BG-320
120	150	60-	120	56-	110	BO-121L	BO-121R	BO-171L	BO-171R	35.	BG-121	47.	BG-221	89.	BG-321
160	200	80-	160	75-	150	BO-122L	BO-122R	BO-172L	BO-172R	47.	BG-122	59.	BG-222	106.	BG-322
210	260	107-	210	100-	195	BO-123L	BO-123R	BO-173L	BO-173R	47.	BG-123	59.	BG-223	106.	BG-323
320	400	160-	320	150-	300	BO-124L	BO-124R	BO-174L	BO-174R	50.	BG-124	62.	BG-224	113.	BG-324
420	525	210-	420	200-	400	BO-125L	BO-125R	BO-175L ‡	BO-175R ‡	64.	BG-125	76.	BG-225	141.	BG-325
640	800	320-	640	300-	600	BO-126L	BO-126R	BO-176L ‡	BO-176R ‡	78.	BG-126	96.	BG-226	186.	BG-326

\*See explanation of left hand and right hand coil terminals above.

‡DC continuous current ratings shown for these relays apply when coil terminals are front connected with suitable lugs. When back connected, dc ratings of Types BO-175 and BO-176 are 420 and 640 amperes respectively.

†These ratings apply to power circuit only — contact rating is 480 volts ac maximum, no dc rating.

### ORDERING INFORMATION REQUIRED

- Specify class and type number.
- Specify Form Y93 if a specific trip setting is desired and whether ac or dc. (If not specified, relay will be set to trip at mid-point of range. See Special Features table on page 4).
- Specify special features desired. (See page 4 for list of special features available.)



## DASHPOT TYPE MAGNETIC CURRENT RELAYS

### Time Delay or Instantaneous Trip Overload and Underload Relays

ADDITIONS, MODIFICATIONS AND SPECIAL FEATURES	Form Letters	Price Addition (Per Relay)		
		Type A	Type B	Type N
Hand reset:				
On open type relay.....	HR	\$2.50	.....	\$2.50
On enclosed relay (Internal reset button is standard).....	HR	2.50	.....	2.50
On enclosed relay — external reset button.....	HR Y65	7.50	.....	7.50
Substitute normally open contact for normally closed.....	Y44	2.50	.....	2.50
Add mounting bracket 750-X103 (Types 101 thru 121 only)▲.....	Y66	N.C.	N.C.	N.C.
Set trip point at factory (specify ampere setting and whether ac or dc).....	Y93	6.00	\$6.00	6.00
Add strap 750-D107-G1 to lock dashpot in place (Supplied as standard on Type N. Recommended on all Types when subject to vibration.).....	Y10	N.C.	N.C.	Std.
Substitute silicone dashpot oil to provide more accurate tripping time under varying ambient temperature:				
For normal acceleration time (Type A relay) specify Type R11 oil.....		1.00	.....	.....
For long time acceleration (Type A relay) specify Type R10 oil (When long accelerating time is involved, a trip setting below midpoint of the range is recommended).....		1.00	.....	.....
For Type B relay specify Type R12 oil.....		.....	1.00	.....

▲Types 101 thru 121 are provided as standard with two tapped holes to accept mounting screws inserted from rear of panel. Bracket allows mounting screws to be inserted from front of panel. (See Class 9055 Dimension Sheets.)

#### ADDITIONAL DASHPOT OIL (Order by Class and Type Number)

OIL STOCK NUMBER (Do not use this number for ordering purposes.)	1 Oz. Bottle Sufficient for One Relay		1 Pint Container		1 Quart Container		1 Gallon Container	
	Class 9055 Type	Price	Class 9055 Type	Price	Class 9055 Type	Price	Class 9055 Type	Price
1615-000020 (formerly 615-R2)★	R2U	\$ .30	R2P	\$ 1.70	R2Q	\$ 2.50	R2G	\$ 6.60
1615-000040 (formerly 615-R4)‡	R4U	1.30	R4P	1.70	R4Q	2.50	R4G	6.60
1615-000060 (formerly 615-R10)	R10U	1.30	R10P	18.00	R10Q	30.00	R10G	95.00
1615-000080 (formerly 615-R11)	R11U	1.30	R11P	18.00	R11Q	30.00	R11G	95.00
1615-000090 (formerly 615-R12)	R12U	1.30	R12P	18.00	R12Q	30.00	R12G	95.00

★Supplied as standard with Type A relays.  
‡Supplied as standard with Type B relays.

#### RECOMMENDED MINIMUM HORSEPOWER

(To avoid excessive voltage drop which may be encountered when using these magnetic current relays with small motors the following minimum hp are recommended).

Motor Type	Minimum Hp
3-Phase	1½
1-Phase	½



AUGUST, 1968

## MAGNETIC CURRENT RELAYS

## APPLICATION

Magnetic current relays are used when an increase or decrease in current must be detected, accompanied by the opening or closing of a control circuit contact. They are frequently used for protection of motor windings from continued overcurrent. Other typical applications are the stopping of a material conveyor when conveyors ahead become overloaded, and as a torque limiting relay where torque is reflected by motor current.

## CONSTRUCTION

All Class 9055 relays consist of a wire wound or formed copper bar coil, through which the load current flows, and a movable plunger assembly within the coil. Current in the coil exerts a magnetic pull on the plunger, tending to lift it. When this pull exceeds the force of gravity, the plunger rises to strike an insulating trip pin, which in turn operates the control circuit contacts.

**Simple, Rugged Design** of Class 9055 relays has been thoroughly field proven over the many years since their introduction. Three basic types are offered: time delay trip, instantaneous trip, and underload trip.

**Adjustable Trip Current** — The value of current required to trip the relay is adjustable over a two-to-one range by screwing the plunger up or down on its stem. Calibration marks on the plunger give a visual indication of this setting. Trip current ranges for particular relays are listed on Class 9055 Price Sheets.

**Operating Coils** are available with continuous ratings up to 640 amperes ac, 800 amperes dc.

## TIME DELAY TRIP TYPE

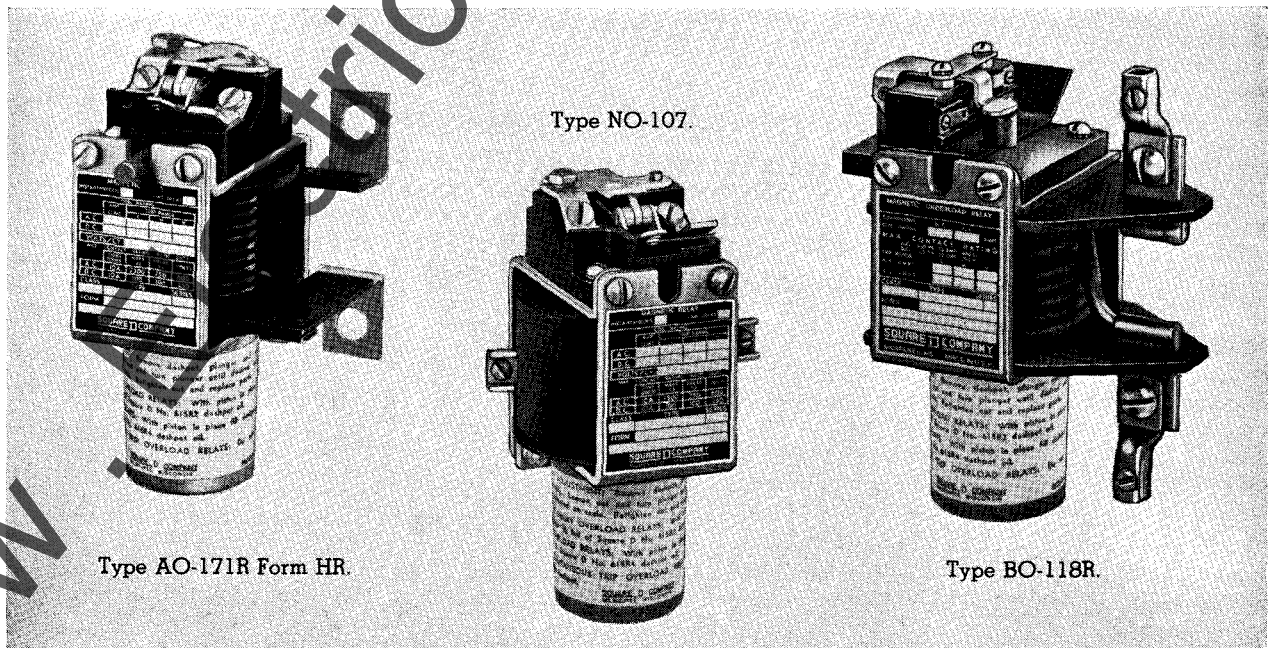
**Type A Overload Relays** are provided as standard with a single pole, normally closed contact. Design of the contact linkage assures positive, quick operation. For special applications a single pole, normally open contact (Form Y44) can be substituted.

## CONTACT RATING

	Max Volts	Inductive — Pilot Duty 35% Power Factor		Resistive 75% P.F.
		Make	Break	Make & Break
AC	600	7500 VA	750 VA	10 Amp.
DC	250	100 VA	100 VA	.....

Maximum Continuous Rating — 10 Amperes.

**Inverse-Time Characteristics** of Type A relays provides dependable motor protection, while preventing nuisance tripping on normal motor starting currents. The relay plunger is attached to a piston immersed in an oil-filled dashpot. Tripping action is retarded by the oil, which is forced through by-pass holes in the piston. A disc in the piston may be turned to open or close different by-pass holes, allowing a choice of five distinct trip time characteristics. Extreme changes in ambient temperature do not change relay trip current, but do affect tripping time. Special silicone dashpot oil is available for such applications.



Type AO-171R Form HR.

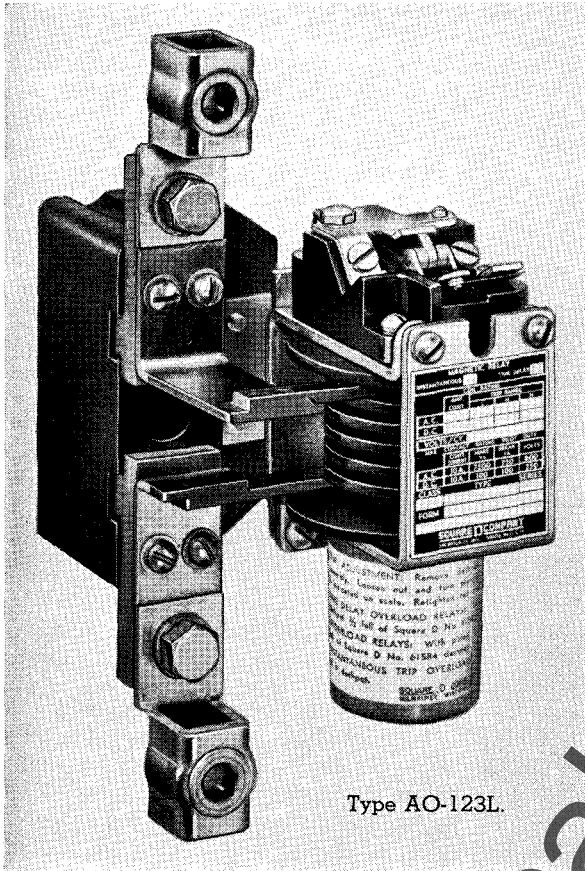
Type NO-107.

Type BO-118R.



# MAGNETIC CURRENT RELAYS

AUGUST, 1968



Type AO-123L.

**Reset Point** — Once the relay has tripped, current must be reduced to a very low value before reset occurs. To accomplish this, the relay should always be wired so that operation of the contact disconnects the motor (or other load) from the line.

**Automatic Reset** is a standard feature of Type A relays. A one-way valve in the piston provides very short reset time.

**Hand Reset** (Form HR) is also available.

## INSTANTANEOUS TRIP TYPE

**Type N Overload Relays** provide instantaneous trip operation on any overload. Relays with this feature are often used for baler control, where it is necessary to stop the motor when full load current reaches the point corresponding to required baling pressure. On conveyor systems, Type N relays are used to stop a conveyor when a jam occurs, preventing damage to materials and machinery.

A three wire control scheme is necessary, since the relay contact must be shorted out with a start button during the motor accelerating period. Hand reset (Form HR) cannot be used on applications of this type, although this feature can be furnished for use in special circuits.

•Revised

**Construction** of instantaneous trip relays is similar to the Type A time delay trip relay, except for a special plunger assembly designed for frequent duty. Dashpot oil is not used.

**Contact Rating** is the same as listed for Type A overload relays. A normally open contact (Form Y44) can be provided in place of the standard normally closed contact if desired.

•**Reset Point** of Type N relays on ac is approximately 80% of the trip current setting, and on dc is approximately 67%. To avoid plunger noise on ac circuits, these relays should be wired so that tripping disconnects the load current. Use Type B relay below if relay is to remain energized after tripping.

## •UNDERLOAD TRIP TYPE

**Type B Underload Relays** are similar to Type A overload relays, except that single pole, double throw, snap action contacts are provided, and time delay is much shorter.

### CONTACT RATING

Max. Volts (AC Only)	Inductive — Pilot Duty 35% Power Factor		Resistive 75% P.F.
	Make	Break	Make & Break
480	7200 VA	720 VA	15 Amp.

These relays are widely used where a load condition on one motor is to stop or start another motor. On hammer mills, for example, the relay coil is wired in series with the drive motor to monitor the load, and the relay contact is used to start and stop a conveyor feeding material into the mill.

**Reset Point** — Reset occurs automatically when current drops to 88-90% of the trip current setting on ac, 80-85% on dc. Because of this consistent reset point, Type B relays may be used to detect an underload condition. In such applications the relay would be energized (tripped) on normal load current, and de-energized (reset) on pre-determined level of underload.

**Quick Tripping** is obtained through use of a light grade dashpot oil. Time delay can be adjusted by opening or closing by-pass holes in the piston. At the minimum setting, time delay is just sufficient to prevent nuisance tripping on low, momentary overloads.

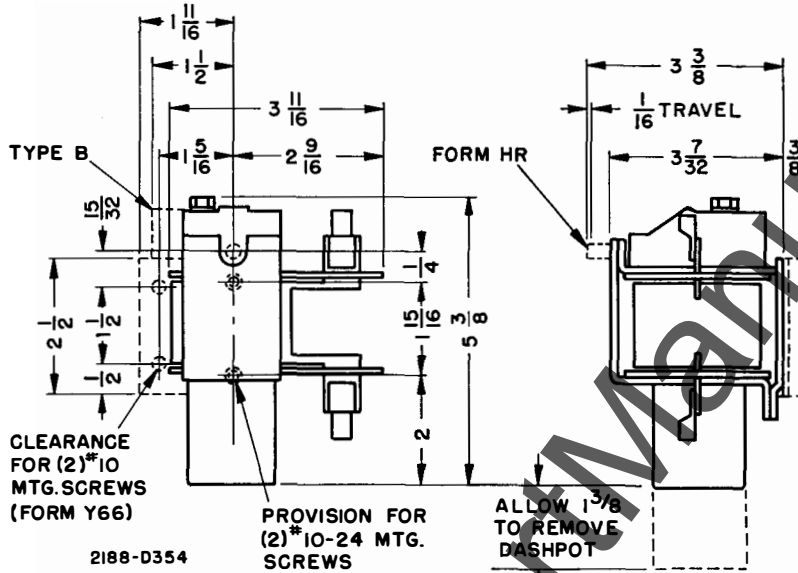
## MOUNTING

Class 9055 open type relays are available for customer mounting on either steel or insulating panels. Pressure wire connectors are furnished on coil terminals of relays rated 20 amperes ac or less. On larger devices (except those intended for insulating panel mounting), solderless lugs are provided. Class 9055 relays are also available in NEMA 1, general purpose enclosures.

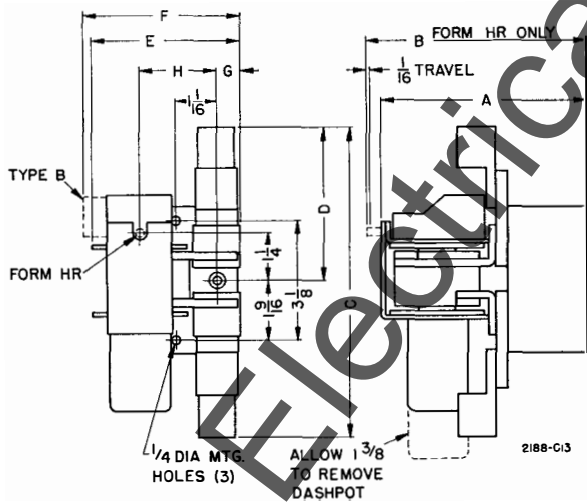




**MAGNETIC CURRENT RELAYS**  
Approximate Dimensions — Not for Construction



Types AO-117R thru 121R, BO-117R thru 121R, NO-117R thru 121R \*



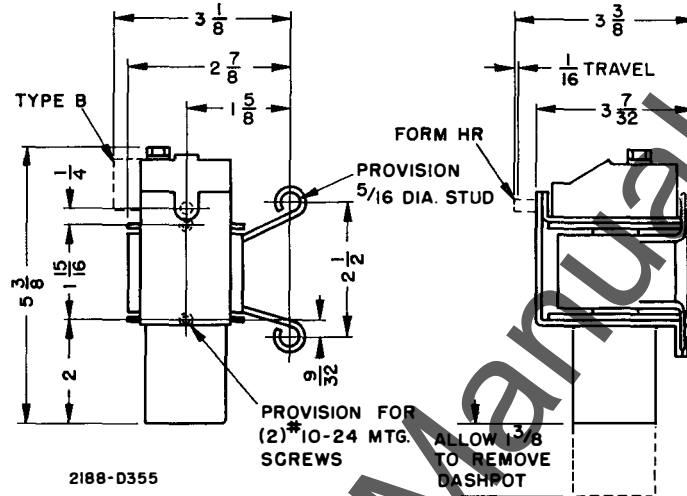
Type *	Dimension							
	A	B	C	D	E	F	G	H
AO-122R	5 1/32	5 19/32	8 3/8	4 3/16	3 13/16	...	3/16	2
BO-122R	5 3/8	...	8 3/8	4 3/16	...	4 1/8	9/16	...
NO-122R	5 1/32	5 19/32	8 3/8	4 3/16	3 13/16	...	9/16	2
AO-123R	5 1/32	5 19/32	8 3/8	4 3/16	3 13/16	...	9/16	2
BO-123R	5 3/8	...	8 3/8	4 3/16	...	4 1/8	3/16	...
NO-123R	5 1/32	5 19/32	8 3/8	4 3/16	3 13/16	...	9/16	2
AO-124R	5 3/8	5 19/32	9 1/2	4 3/4	4 3/16	...	1 5/16	2
BO-124R	5 3/8	...	9 1/2	4 3/4	...	4 1/2	1 5/16	...
NO-124R	5 3/8	5 19/32	9 1/2	4 3/4	4 3/16	...	1 5/16	2
AO-125R	5 3/8	5 27/32	9 1/2	4 3/4	4 3/16	...	1 5/16	2
BO-125R	5 3/8	...	9 1/2	4 3/4	...	4 1/2	1 5/16	...
NO-125R	5 3/8	5 27/32	9 1/2	4 3/4	4 3/16	...	1 5/16	2
AO-126R	5 3/8	6 1/16	13 11/16	6 27/32	4 13/16	...	1 3/16	2 1/2
BO-126R	5 3/8	...	13 11/16	6 27/32	...	5 3/16	1 3/16	...
NO-126R	5 3/8	6 1/16	13 11/16	6 27/32	4 13/16	...	1 3/16	2 1/2

\*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.

Dimensions are in inches.

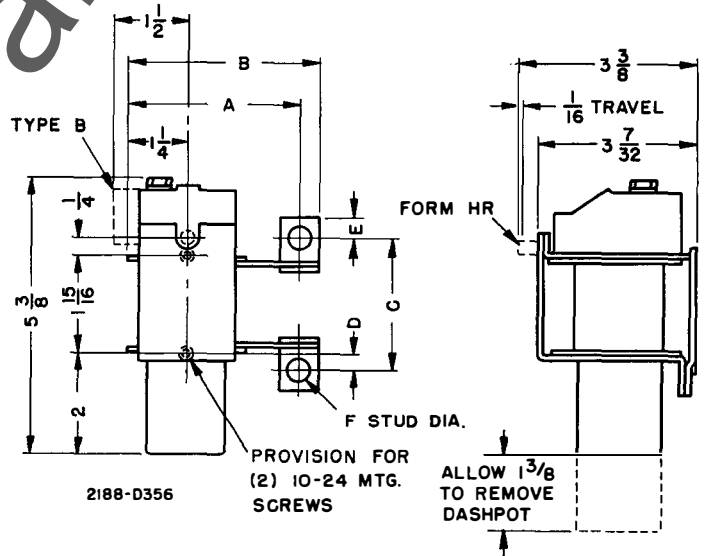


**MAGNETIC CURRENT RELAYS**  
Approximate Dimensions — Not for Construction



Types AO-167R thru 169R BO-167R thru 169R, NO-167R thru 169R \*

\*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 center-line, therefore, would be reversed.



Type *	Dimension					
	A	B	C	D	E	F
AO-170R thru 173R.....	2 7/8	3 1/4	2 1/2	1/32	3/8	3/8
BO-170R thru 173R.....	2 7/8	3 1/4	2 1/2	1/32	3/8	3/8
NO-170R thru 173R.....	2 7/8	3 1/4	2 1/2	1/32	3/8	3/8
AO-174R, BO-174R, NO-174R.....	3 1/4	3 7/8	3	1 1/32	9/16	1/2
AO-175R, BO-175R, NO-175R.....	3 1/4	3 7/8	3	1 1/32	9/16	1/2
AO-176R, BO-176R, NO-176R.....	3 3/4	4 1/2	5	1 1/32	1 1/4	3/4-10

Dimensions are in inches.

**SQUARE D COMPANY**

Dimensions Subject to Change without Notice.

11-276  
12-4

[www.ElectricalPartManuals.com](http://www.ElectricalPartManuals.com)

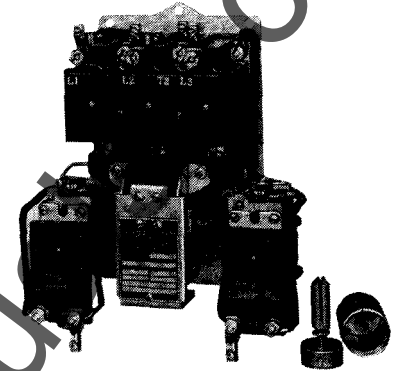
# REPLACEMENT MAGNETIC CURRENT RELAYS

CLASS  
**9055**

## CLASS 8536 TYPES DMO AND EMO MAGNETIC STARTERS

Starter Class 8536 Type	Replacement Relay — Class 9055				
	Current Range	Type*	Price	Type*	Price
DMO-1	1.6-3.2	AO109-S1	\$185.	AO109-S1	\$185.
	2.0-4.0	AO110-S1	185.	AO110-S1	185.
	2.4-4.8	AO111-S1	185.	AO111-S1	185.
	4.0-8.0	AO113-S1	185.	AO113-S1	185.
	5.0-10.0	AO114-S1	185.	AO114-S1	185.
	6.0-12.0	AO115-S1	185.	AO115-S1	185.
	10-20	AO116-S1	185.	AO116-S1	185.
	16-32	AO117-S1	185.	AO117-S1	185.
	24-48	AO118-S1	185.	AO118-S1	185.
	30-60	AO119-S1	185.	AO119-S1	185.
	EMO-1	10-20	AO116L-S2	\$192.	AO116R-S2
16-32		AO117L-S2	192.	AO117R-S2	192.
24-48		AO118L-S2	192.	AO118R-S2	192.
30-60		AO119L-S2	192.	AO119R-S2	192.
40-80		AO120L-S2	192.	AO120R-S2	192.
60-120		AO121L-S2	192.	AO121R-S2	192.

\* Devices with the letter "R" in the type number have right hand coil terminals, and are mounted on the left hand side of the starter. Devices with the letter "L" in the type number have left hand coil terminals and are mounted on the right hand side of the starter. Devices without a letter "L" or "R" in the type number have the coil terminals mounted on a terminal board on the front of the relay and mount on either side of the starter. Devices are supplied with Class 9055 Type R2U dashpot oil. Class and type number of relay is stamped on the relay nameplate.

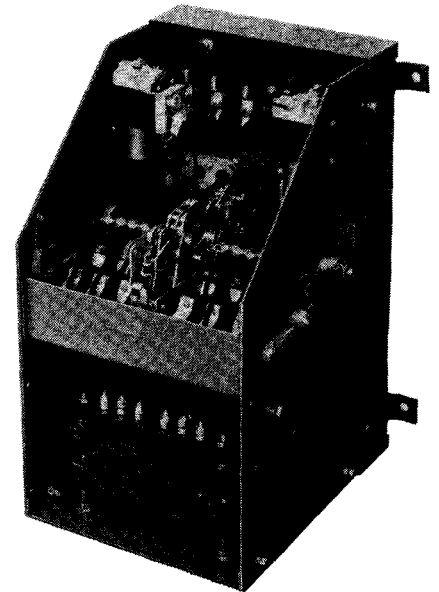


Size 2 Starter with Magnetic Overload Relays. Dashpot is removed to show plunger.

## CLASS 2605 AND 2607 MANUAL COMPENSATORS

Replacement Relay — Class 9055				
Current Range	Type *	Price	Type*	Price
6.0-12.	AO115L-S5	\$173.	AO115R-S5	\$221.
10.-20.	AO116L-S5	173.	AO116R-S5	221.
16.-32.	AO117L-S5	173.	AO117R-S5	221.
24.-48.	AO118L-S5	173.	AO118R-S5	221.
30.-60.	AO119L-S5	173.	AO119R-S5	221.
40.-80.	AO120L-S5	173.	AO120R-S5	221.
60.-120.	AO121L-S5	173.	AO121R-S5	221.
80.-160.	AO122L-S5	\$214.	AO122R-S5	\$259.
107.-210.	AO123L-S5	214.	AO123R-S5	259.

\* Devices with the letter "R" in the type number have right hand coil terminals, and are mounted on the left hand side in the compensator. Devices with the letter "L" in the type number have left hand coil terminals, and are mounted on the right hand side in the compensator. The "R" types are provided with a "stop" button mounted on the frame. Devices are supplied with Class 9055 Type R2U dashpot oil. Class and type number of relay is stamped on the relay nameplate.



75 ampere compensator with top and front removed to show magnetic overload relays.

### ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase, frequency and full load current of motor.

[www.ElectricalPartManuals.com](http://www.ElectricalPartManuals.com)

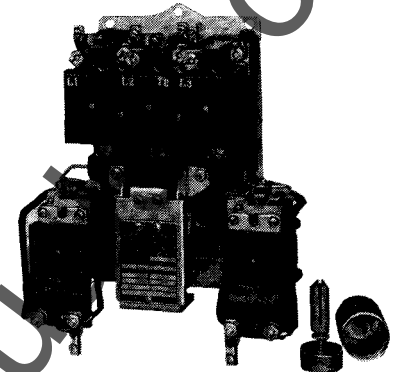
# REPLACEMENT MAGNETIC CURRENT RELAYS

CLASS  
9055

## CLASS 8536 TYPES DMO AND EMO MAGNETIC STARTERS

Starter Class 8536 Type	Replacement Relay — Class 9055				
	Current Range	Type*	Price	Type*	Price
DMO-1	1.6-3.2	AO109-S1	\$185.	AO109-S1	\$185.
	2.0-4.0	AO110-S1	185.	AO110-S1	185.
	2.4-4.8	AO111-S1	185.	AO111-S1	185.
	4.0-8.0	AO113-S1	185.	AO113-S1	185.
	5.0-10.0	AO114-S1	185.	AO114-S1	185.
	6.0-12.0	AO115-S1	185.	AO115-S1	185.
	10-20	AO116-S1	185.	AO116-S1	185.
	16-32	AO117-S1	185.	AO117-S1	185.
	24-48	AO118-S1	185.	AO118-S1	185.
	30-60	AO119-S1	185.	AO119-S1	185.
EMO-1	10-20	AO116L-S2	\$192.	AO116R-S2	\$192.
	16-32	AO117L-S2	192.	AO117R-S2	192.
	24-48	AO118L-S2	192.	AO118R-S2	192.
	30-60	AO119L-S2	192.	AO119R-S2	192.
	40-80	AO120L-S2	192.	AO120R-S2	192.
	60-120	AO121L-S2	192.	AO121R-S2	192.

\*Devices with the letter "R" in the type number have right hand coil terminals, and are mounted on the left hand side of the starter. Devices with the letter "L" in the type number have left hand coil terminals and are mounted on the right hand side of the starter. Devices without a letter "L" or "R" in the type number have the coil terminals mounted on a terminal board on the front of the relay and mount on either side of the starter. Devices are supplied with Class 9055 Type R2U dashpot oil. Class and type number of relay is stamped on the relay nameplate.

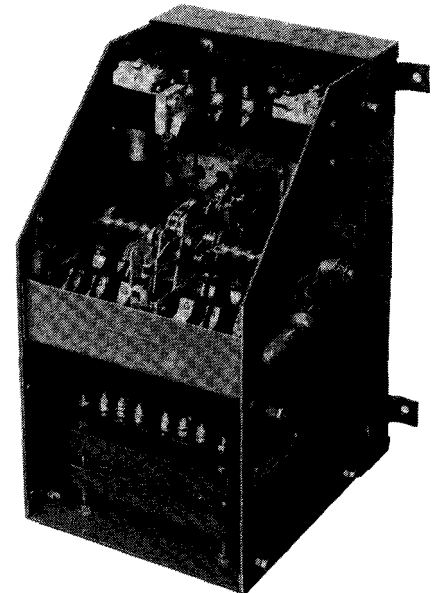


Size 2 Starter with Magnetic Overload Relays. Dashpot is removed to show plungers.

## CLASS 2605 AND 2607 MANUAL COMPENSATORS

Replacement Relay — Class 9055				
Current Range	Type*	Price	Type*	Price
6.0-12.	AO115L-S5	\$173.	AO115R-S5	\$221.
10.-20.	AO116L-S5	173.	AO116R-S5	221.
16.-32.	AO117L-S5	173.	AO117R-S5	221.
24.-48.	AO118L-S5	173.	AO118R-S5	221.
30.-60.	AO119L-S5	173.	AO119R-S5	221.
40.-80.	AO120L-S5	173.	AO120R-S5	221.
60.-120.	AO121L-S5	173.	AO121R-S5	221.
80.-160.	AO122L-S5	\$214.	AO122R-S5	\$259.
107.-210.	AO123L-S5	214.	AO123R-S5	259.

\*Devices with the letter "R" in the type number have right hand coil terminals, and are mounted on the left hand side in the compensator. Devices with the letter "L" in the type number have left hand coil terminals, and are mounted on the right hand side in the compensator. The "R" types are provided with a "stop" button mounted on the frame. Devices are supplied with Class 9055 Type R2U dashpot oil. Class and type number of relay is stamped on the relay nameplate.



75 ampere compensator with top and front removed to show magnetic overload relays.

### ORDERING INFORMATION REQUIRED

1. Class and type number.
2. Horsepower, voltage, phase, frequency and full load current of motor.

[www.ElectricalPartManuals.com](http://www.ElectricalPartManuals.com)