SV-700 Series

Piston Operated Diaphragm Valve

OMEGA®

An OMEGA Technologies Company

Operator's Manual

OMEGA®
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It is the policy of OMEGA to comply with all worldwide safety and EMC/EMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

CJS0396FVRA

Remove the Packing List and verify that you have received all equipment, including the following (quantities in parentheses):

SV-700 Piston Operated Diaphragm Valve (1)

Operator's Manual (1)

If you have any questions about the shipment, please call the OMEGA Customer Service Department.

When you receive the shipment, inspect the container and equipment for signs of damage. Note any evidence of rough handling in transit. Immediately report any damage to the shipping agent.

NOTE

The carrier will not honor damage claims unless all shipping material is saved for inspection. After examining and removing contents, save packing material and carton in the event reshipment is necessary.

From the Technical Library From_____

PVC Body-Normally Closed Valve

Part Number	Orifice (in.)	Kv Value (water) m³/hr GPM	Operating Pressure Bar/PSI	Diaphragm	kg/lb
SV-701	9/16	50./22.0	6/87	EPDM	0.6/1.32
SV-702	3/4	7.5./33.0	6/87	EPDM	1.1/2.43
SV-703	1	13.5/59.4	10/145	EPDM	1.9/4.19
SV-704	1-1/4	28.0/123.3	8/116	EPDM	3.4/7.50
SV-705	1-1/2	36.0/158.5	6/87	EPDM	3.6/7.95
SV-706	2	53.0/233.4	8/116	EPDM	6.6/14.57

To order normally open valve, add suffix "-NO" to part number

PVDF Body-Normally Closed Valve

Part Number	Orifice (in.)	Kv Value (water) m³/hr GPM	Operating Pressure Bar/PSI	Diaphragm	kg/lb
SV-711	9/16	50./22.0	6/87	PTFE	0.9/1.98
SV-712	3/4	7.5./33.0	6/87	PTFE	1.7/3.75
SV-713	1	13.5/59.4	6/87	PTFE	1.7/3.75
SV-714	1-1/4	28.0/123.3	6/87	PTFE	3.2/7.06
SV-715	1-1/2	36.0/158.5	6/87	PTFE	5.2/11.47
SV-716	2	53.0/233.4	6/87	PTFE	5.7/12.58

To order normally open valve, add suffix "-NO" to part number

Options

Part Number	Description
SV7-PI	Electrical position indicator for SV-701/711 through SV-703/713
SV7-PI2	Electrical position indicator for SV-704/714 through SV-706/716
SV7-SL	Stroke limiter for SV-701/711 through SV-703/713
SV7-SL2	Stroke limiter for SV-704/714 through SV-706/716

Introduction

Carefully read the installation and operating instructions. Attention must be paid to the application conditions and the technical data as specified in the data sheet. Complying with these instructions will ensure perfect operation and a long service life.
Application and operation of the device must ensue according to the general terms of technology. Appropriate measures must be taken to avoid unintended operation or unapproved impairment.

Valve design

2-way piston-operated valve, control function A (normally closed spring return), B (normally open spring return) or I (with double-acting actuator).

Actuator Size	C	D	E	F	G	H
Ø (mm)	40	50	65	80	100	125

Fluid

- Contaminated and aggressive fluids, that do not corrode the body and seal materials (plastic, stainless steel). Attention must be paid to the admissible pressure ranges and fluid temperatures as specified on the data sheet or the type label.

Control Fluid

- Neutral gases and air
- Ambient temperature

Actuator	Actuator Size	Temperature*1
PA	C-H	-10 to +60°C
PPS	C-F	+5 to +140°C
	G/H	+5 to + 90°C (for short periods up to 140°C)

*1 max. + 55°C with pilot valve.

- Fluid temperature depending on:

Body material	Temperature
PVC	-10 to +60°C
PVDF	-10 to +120°C
PP	-10 to +80°C

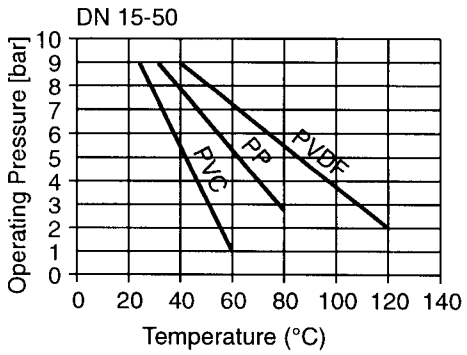
Diaphragm material	Temperature range	Short-term approx. temp.
EPDM	-10 to +120°C	140°C
FPM	0 to +130°C	150°C
PTFE/EPDM	-10 to +130°C	140°C
PTFE/FPM	0 to +140°C	150°C
PTFE/Butyl	-10 to +120°C	140°C

Operating pressure

Observe specification on the type label.

DN	Actuator Size	max. tight pressure [bar] applied to one side EPDM, FPM	PTFE	applied to both sides EPDM, FPM	PTFE
9/16	D E	7 10	– 8.5	6 10	– 6
3/4	E F	7.5 10	– 10	6 10	– 8
1	E F	5 10	– 7	4 8.5	– 6
1-1/4	G	10	8	9	6
1-1/2	G H	7 10	5 10	6 10	4 9
2	G H	5 8.5	– 7	4 7	– 4.5
2-1/2	H	7	–	5.5	–

- Version with plastic body



Control pressure

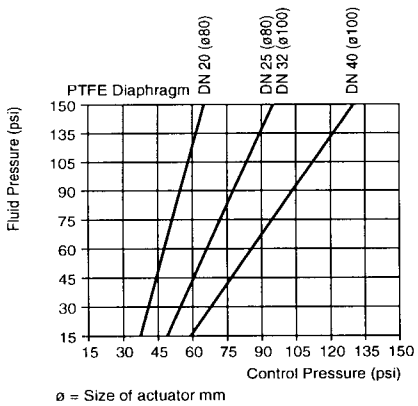
Admissible control pressure as specified on the type label.

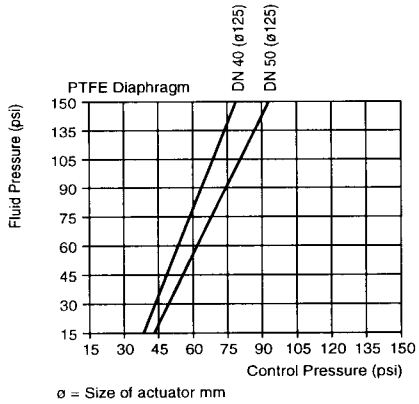
Actuator Size	Actuator	P_{st} [bar]
C-G	PA	10
H	PA	7
C-H	PPS	7

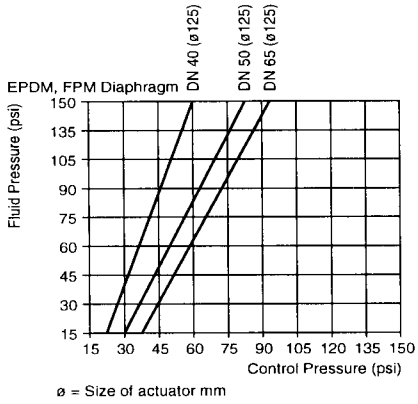
- Control function B and I
  For the required control pressures, see flow charts.

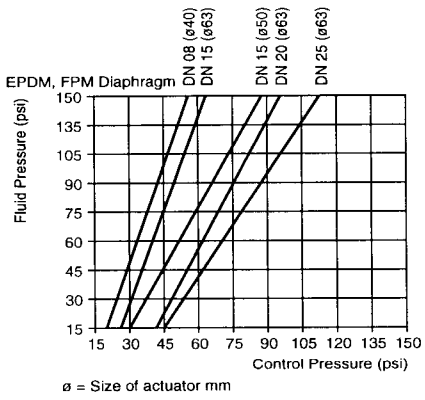
! For control function B, do not select the control pressure higher than required, in order to ensure a long service life of the diaphragm.

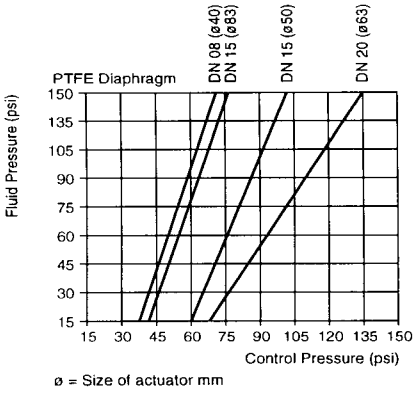
– PVC-body with PTFE-diaphragm max. operating pressure 8 bar.

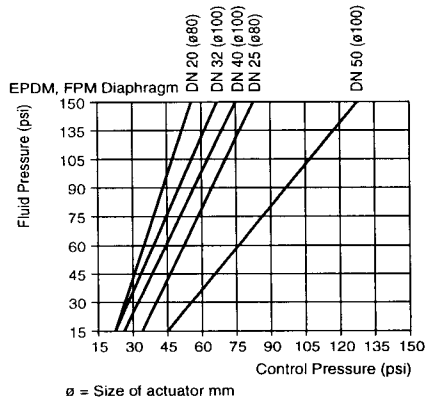












- Control Function A

DN	Actuator Size	p_{st} at P_M =0	p_{st} at P_M = max
9/16	D E	5 5.5	4.5 4.7
3/4	E F	5.5 5.2	5 4.5
1	E F	5.5 5.5	4 4.5
1-1/4	G	5.5	4
1-1/2	G H	5.5 5	4.2 4.6
2	G H	5.5 5	4.2 4.5
2-1/2	H	5.5	4.5

Note

For versions with reduced spring action (i.e. with low control pressures), consult OMEGA for advice.

Installation Procedure

The applicable safety regulations must be observed.

! Pipelines must be contamination-free.

- Installation as required, but preferably with actuator upright. Self-draining, with inclination of 15-30° against horizontal line.
- Connect valve. Observe aligned pipes.

– Plastic bodies must be fitted directly with the pre-viewed insert nuts.

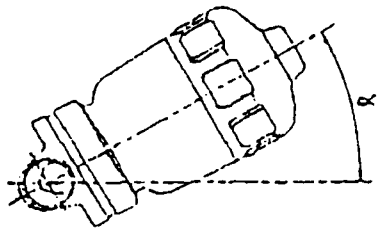
- Connection of control fluid for control function:

– A, to the lower

– B, to the upper

– I, to the upper and lower actuator port with G 1/4 thread (connection can be rotated by 360°).

! When using 3/2-way pilot valves, they must be connected to the actuator with the double fitting, according to the respective control function. The control fluid must be connected to port P of the pilot valve.



Repair/Maintenance

Stop fluid supply and reduce pressure in the pipe system, before opening or repairing the product.

- Check diaphragm on wear after max. 100000 cycles.

! Slurry or abrasive fluids and high fluid temperatures? Ask for accordingly shorter examination intervals.

Body Installation

– Actuator with control function A

- Pressurize actuator with control pressure and slightly tighten body screws crosswise, until the diaphragm is between body and actuator.
- Actuate valve twice and tighten the body screw to nominal torque without control pressure.

– Actuator with control function B or I

- Slightly tighten body screws without pressurizing the actuator.
- Actuate valve twice and tighten the body screws without control pressure to nominal torque (M_N), as specified in the chart below.

DN	M_N [Nm] for diaphragm of	
	EPDM/FPM	PTFE
9/16	3.5	4
3/4	4	4.5
1	5	6
1-1/4	6	8
1-1/2	8	10
2	12	15
2-1/2	15	20

Storing

If the valves are intended to be stored for longer periods, the body screws must be loosened. Otherwise this could result in diaphragm deformations due to lack of fluid pressure.

Electrical connection

Observe voltage and current type as specified on the type label, voltage tolerance ± 10%. Specifications in the data sheet and the operating instructions of the pilot valve must be observed.

Spare part kits

One seal kit, diaphragm or body can be ordered as spare parts.

Seal Kit

Actuator Size	DN	PPS-Actuator Part Number	PA-Actuator Part Number
D	1/2	011 477 N	011 426 B
E	1/2, 3/4	011 488 J	011 440 V
F	3/4, 1	011 492 E	011 448 Z
G	1-1/4, 1-1/2	012 127 G	012 125 E
H	1-1/2, 2	011 494 G	011 464 R

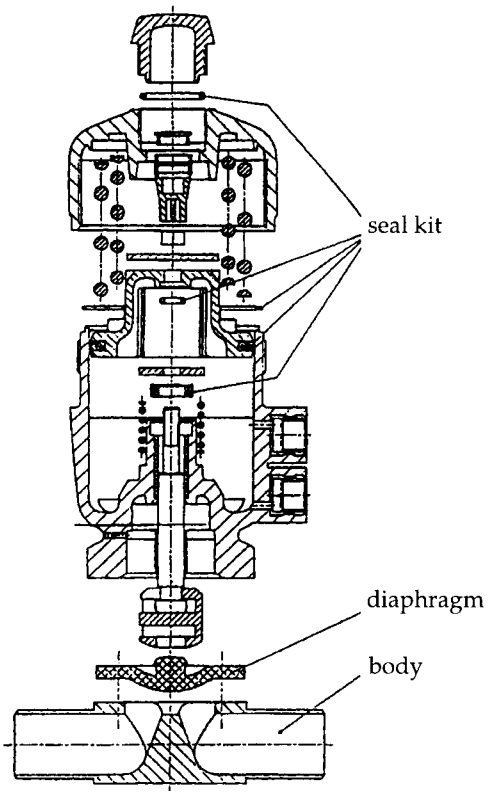
Diaphragms

DN	EPDM Part Number	FPM Part Number	PTFE Part Number
1/2	631 717 Y	632 323 W	635 555 S
3/4	631 718 H	632 324 X	635 55 T
1	631 719 A	632 325 Y	635 557 U
1-1/4	632 326 Z	632 327 S	635 558 D
1-1/2	632 328 B	632 329 C	635 559 E
2	632 330 H	632 331 W	635 560 B
2-1/2	on request	on request	on request

Body

DN	PVC-socket union Part Number	PVC-fusion spigot Part Number	PVDF-plain spigot Part Number
1/2	632 557 Z	632 545 V	632 551 T
3/4	632 558 A	632 546 W	632 552 U
1	632 559 B	632 547 X	632 553 V
1-1/4	632 804 S	632 548 G	635 554 W
1-1/2	632 805 T	632 549 H	632 555 X
2	632 806 U	632 550 E	632 556 Y
2-1/2	on request	on request	on request

Spare part drawing



Specifications

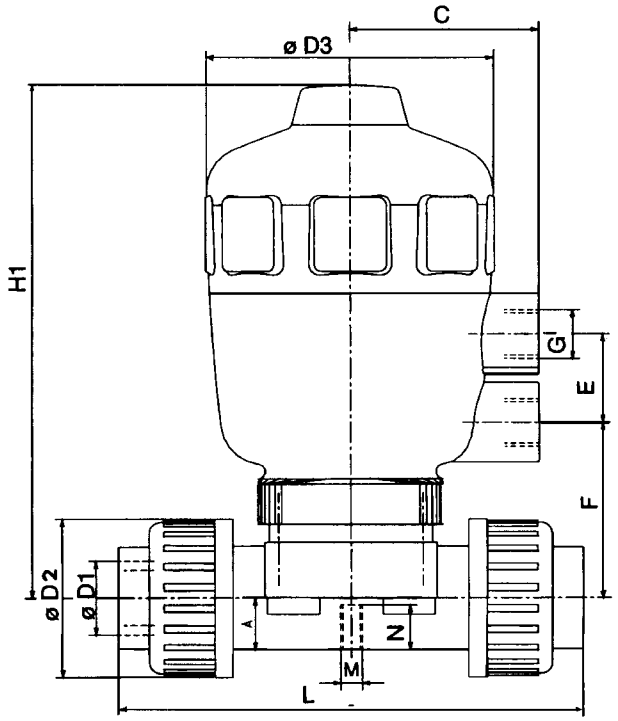
VALVE

Fluid Temperature : (Depending on Diaphragm Material)	PVDF: 0-120°C (32 to 248°F); PVC: 0-60°C (32 to 140°F)
Installation Connection:	PVDF fusion spigot; PVC socket union

ACTUATOR

Ambient Temperature:	-10 to 60°C (14 to 140°F)
Control Pressure	
Circuit Function A (Normally Closed):	Min. Required: 5.5 bar/79.8 PSI; Max. Admissible: 10 bar/145 PSI
Circuit Function B (Normally Open):	The following max. control pressures are required for max. operating pressure: EPDM diaphragm: P_{ST} = 4.5 bar/65.2 PSI PTFE diaphragm: P_{ST} = 5.0 bar/72.5 PSI
Control Fluid:	Neutral gases, air.
Flow Adjustment:	Variations of flow within the maximum and minimum valves can be adjusted by use of the piston stroke limiting feature.
Electrical Position Indicator:	Mechanical or inductive position sensing (open and/or closed); LED display; self-adjusting trip cam for closed position.

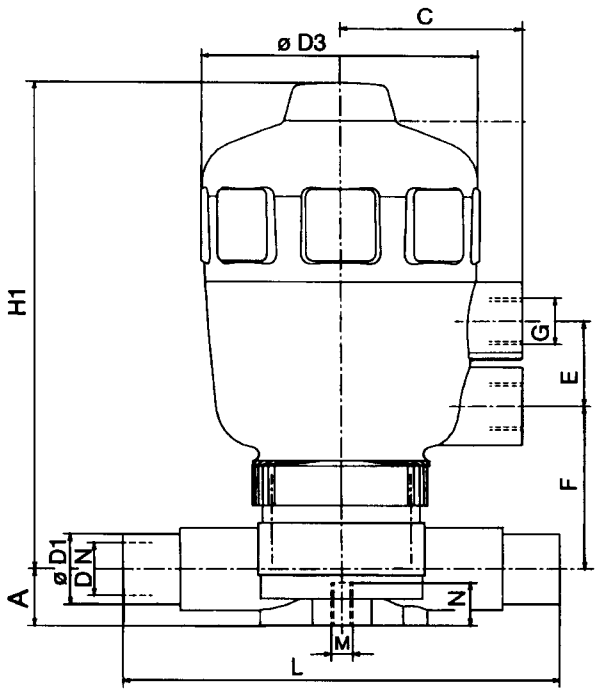
PVC Valve Dimensions



Orifice Size	A	C	D1	D2	D3	E	F	H1	L	M	N	P
9/16	0.55	2.05	0.84	1.69	3.15	0.94	1.85	5.47	5.04	M6	0.47	0.98
3/4	0.71	2.36	1.05	2.09	3.98	0.94	2.52	6.81	5.98	M6	0.47	0.98
1	0.83	2.36	1.32	2.36	3.98	0.94	2.64	6.93	6.54	M6	0.47	0.98
1-1/4	1.02	2.87	1.66	2.91	5.00	0.94	3.31	9.09	7.56	M8	0.59	1.77
1-1/2	1.30	3.39	1.90	3.27	6.02	1.18	3.90	10.91	8.74	M8	0.59	1.77
2	1.54	3.39	2.38	4.06	6.02	1.18	4.17	11.18	10.74	M8	0.59	1.77

All dimensions are in inches

PVDF Valve Dimensions



Orifice Size	A	C	D1*	D3*	E	F	H1	L	M	N	P
9/16	0.55	2.05	0.79	3.15	0.94	1.77	5.39	4.88	M6	0.47	0.98
3/4	0.71	2.36	0.98	3.98	0.94	2.48	6.77	5.67	M6	0.47	0.98
1	0.83	2.36	1.26	3.98	0.94	2.60	6.89	6.06	M6	0.47	0.98
1-1/4	1.02	2.87	1.57	5.00	0.94	3.23	9.02	6.85	M8	0.59	1.77
1-1/2	1.30	3.39	1.97	6.02	1.18	3.86	10.87	7.87	M8	0.59	1.77
2	1.54	3.39	2.48	6.02	1.18	4.13	11.14	9.06	M8	0.59	1.77

**Note: Dimensions for Metric PVDF Piping*
All dimensions are in inches

NOTES

NOTES

WARRANTY/DISCLAIMER

OMEGA warrants this unit to be free of defects in materials and workmanship and to give satisfactory service for a period of **13 months** from date of purchase. OMEGA Warranty adds an additional one (1) month grace period to the normal **one (1) year product warranty** to cover handling and shipping time. This ensures that OMEGA's customers receive maximum coverage on each product. If the unit should malfunction, it must be returned to the factory for evaluation. OMEGA's Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective it will be repaired or replaced at no charge. However, this WARRANTY is VOID, if the unit shows evidence of having been tampered with or shows evidence of being damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA's control. Components which wear or which are damaged by misuse are not warranted. These include contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. Nevertheless, OMEGA only warrants that the parts manufactured by it will be as specified and free of defects.

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CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a "Basic Component" under 10 CFR 21 (NRC), used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY / DISCLAIMER language, and additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS / INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA ENGINEERING Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA'S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

FOR **WARRANTY** RETURNS, please have the following information available BEFORE contacting OMEGA:

1. P.O. number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR **NON-WARRANTY** REPAIRS OR **CALIBRATION,** consult OMEGA for current repair/calibration charges. Have the following information available BEFORE contacting OMEGA:

1. P.O. number to cover the COST of the repair/calibration,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA's policy is to make running changes, not model changes, whenever an improvement is possible. This affords our customers the latest in technology and engineering.

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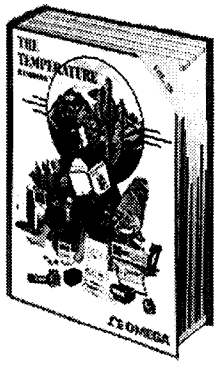

TEMPERATURE

- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
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- Infrared Pyrometers

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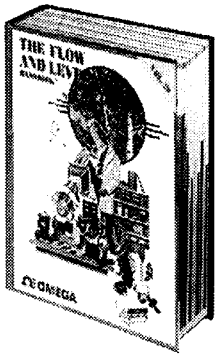

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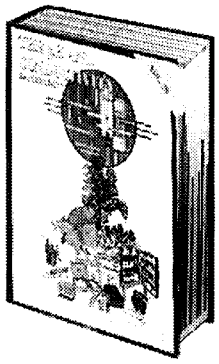

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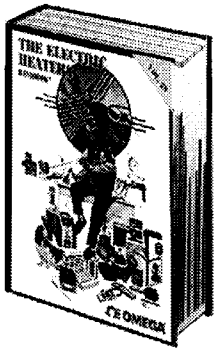

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ENVIRONMENTAL MONITORING AND CONTROL

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M2184/0396