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The manufacturer of this valve is:

WEIR VALVES & CONTROLS Ltd,
Britannia House,
Huddersfield Rd, Elland,
West Yorkshire,
HX5 9JR. England.

A nameplate is attached to the valve giving details in accordance with the valve standard to which this valve has been manufactured. It includes details of the manufacturing contract and item number and the valve figure number. The nameplate details should be quoted in their entirety in any correspondence with Weir valves & Controls, for the enquiry of spare parts or other technical information.

SAFETY WARNING

The following warning/instructions must be followed at all times.

Be aware of Hot surfaces.

Electrically isolate any actuator before adjustment or maintenance to valve.

Valve must be depressurised before any adjustment or maintenance.

Please refer to Weir Valves & Controls UK Ltd Publications.

'SAFETY WITH VALVES' and where appropriate 'SAFETY WITH ELECTRIC ACTUATORS' for general principles on installation, operation and maintenance. However, in all cases these Operating and Maintenance Instructions supersede any alternative information that may be given in, for example non-specific catalogues or the above mentioned general safety publications.

At all times the valve must be maintained to a safe condition and any damaged or worn parts must be replaced with the correct parts supplied by Weir Valves & Controls UK Ltd. Users are strongly recommended to avail themselves of the training courses provided by Weir Valves & Controls UK Ltd who also provide on-site and off-site service and repairs.

We recommend that a record is kept of all work done to this valve, including details of its operating history.

INTRODUCTION

The valve is a "parallel slide" valve designed to ANSI B16.34 and is suitable for a wide range of arduous applications, for example drain duties etc.

These valves are ideal for continued leak tightness when subjected to frequent operation, two-phase flow, thermal shock and have to contend with large pressure drops. For such applications two valves - a martyr valve and master valve - are recommended.

MASTER VALVE	MARTYR VALVE	COMBINED VALVE WITH V PORT SEAT
M268520W	M218520W	M268520W
M268420W	M218420W	M268420W
A26831W	A21831W	A26831W
A26825W	A21825W	A26825W
A26815W	A21815W	A26815W

SAFETY

These instructions contain essential health and safety requirements concerning the safe use of the equipment:

1. For the intended purpose that was specified to Weir Valves & Controls UK Ltd e.g. location, pressure, temperature, fluid etc.
2. When installed, operated, maintained etc. in accordance with these instructions.

Failure to comply with these points in their entirety involves serious risk.

DESCRIPTION AND USE

MARTYR VALVE - incorporates a 'V' port outlet seat and is ideal for regulating the flow. The 'V' is set back from the sealing face and thus any wear associated with high velocities and throttling is confined to the V port and not the sealing face.

MASTER VALVE - has a connecting eyepiece which protects the seat faces and avoids turbulence in the valve. This valve is used in conjunction with the martyr valve to produce maximum benefits of double isolation.

COMBINED VALVE - is offered when space is important. The combined valve incorporates the V port seat and the eye follower.

All valves incorporate titanium nitride coated square gates for enhanced wear resistance, and winged seats for accurate gate guidance and low seat contact stresses when repeatedly handling large pressure drops in the part open position - a Weir Valves & Controls UK Ltd patent.

A nameplate (drawing reference 295) is attached to the valve giving details in accordance with the valve standard to which this valve has been manufactured. . It includes details of the manufacturing contract and item number and the valve figure number. The nameplate details should be quoted in their entirety in any correspondence with Weir Valves & Controls, for the enquiry of spare parts or other technical information.

ACTUATOR OPTION:

A nameplate is also attached to any electric actuator that may be fitted, and similarly all nameplate details should

be quoted in any correspondence concerning the actuator. In addition to these instructions, the Operating and Maintenance Instructions for the actuator must be read and fully understood, and must be consulted in any matter relating to the actuator.

ACTUATORS - motorising frequently operated valves is essential for modern plant operation. Actuators can ensure the master valve is opened first and closed last, and that it is opened to its full open position. Master and martyr operation is designed to preserve the master valve until the martyr valve does eventually wear, from which time the master valve can still maintain leak-tight shut-off.

IMPORTANT NOTE

"Backseating" on this valve refers to bringing the shoulder on the valve stem against the bonnet in order to reduce or prevent any gland leakage that may in time have developed. This does not allow the replacement of gland packing whilst the valve is under pressure, and in this pressurised condition the gland nuts must not be slackened off. Extreme caution must be observed in approaching a valve to either backseat it or un-backseat it. Backseating and un-backseating must only be performed manually using the handwheel, even on actuated valves, and extreme force must not be used in backseating the valve. Backseating the valve is achieved by (first engaging the handwheel drive on actuators), rotating the handwheel anti-clockwise, i.e. in the opening direction.

All these valves are fitted with backseats.

Alternative sized V ports available - standard 50% V port has similar Cv to a globe valve. V ports from 20% to 80% area can be selected for specific applications. For precise, linear regulation, parallel port seats are available from 5% to 30% area - standard parallel port being 10%. The 50% V port provides excellent all round performance and is appropriate for the majority of applications, although we can select a suitable port size if information is provided at the time of enquiry/order.

Actuator options

The electric actuator has been sized for the specific operating conditions that the valve has been designed for. The valve will be opened and closed

to positions set by limit switches. The backseated position must not be used as the open stop position for normal operation as the backseat will not be kept in pristine condition until required. Unauthorised re-setting of the torque switch and limit switch settings must be prevented.

The actuator is designed to close the valve against the specified conditions but its torque switch will stop the actuator if anything should foul the internal parts of the valve and cause the torque switch setting to be exceeded. Extra handwheel effort must not be exerted on the valve or further damage will occur. However, reversing the direction of operation may allow the obstruction to pass through the valve and travel downstream if this is desired. When any defect in the valve and/or actuator is apparent it should be investigated as soon as practicable.

GENERAL

If a valve is found to leak in its closed position, extra effort must not be applied by the use of the handwheel, and the valve should be attended to at the earliest possible time. No benefit is served by forcing the valve past its shut position. If this is done, damage will be done to the stop. If the valve is leaking, a better seal may sometimes be obtained by moving the stem slightly towards open - but still keeping the valve on lap.

ELECTRIC OPERATION

Note that the actuator is intended for intermittent operation - continuous repeated operation will cause overheating.

MANUAL OPERATION OF ACTUATORS

Manual operation of the valve is permissible after firstly ensuring the actuator is not running and then engaging the handwheel clutch mechanism. The handwheel may then be turned clockwise to shut the valve, or anti-clockwise to open the valve. To backseat the valve, hand operation must be adopted by further turning the handwheel anti-clockwise from the shut position. Do not use extreme force or handwheel "keys" for any position. The handwheel clutch mechanism is operated by a lever on the actuator. The lever should be rotated through approximately 90°, and the handwheel turned. The clutch might not engage straight away and the clutch lever should be held towards the "hand" position until the handwheel is felt to take up the drive and the valve stem begins to move. The engaged clutch lever can then be released as the drive will remain engaged.

The position of the valve will be indicated by the mechanical position indicator.

The handwheel drive automatically disengages itself on starting the electric motor and will not be rotated by the actuator motor.

SEQUENCE OF OPERATION

When two valves are supplied for double isolation, then when the two valves are operated in a preferential sequence they will produce even better results. If one of the valves is fully opened first and shut last then the 'preferential' treatment of this valve will allow it to remain leak-tight for even longer periods of time. The second valve then has the job of opening against full pressure and regulating the flow. As a result of fair wear and tear this valve may not eventually remain totally leak tight, but this is of no consequence as the other valve can be relied upon to provide better isolation. Such valves are known respectively as 'master and martyr valves' and provide an even more cost-effective operation than the simple double isolation which neglects to use valves in this preferential manner.

Once a particular sequence of operation has been adopted, it is imperative that that method is continued with, to avoid the operation simply becoming 'double isolation' without the added benefits brought by 'master and martyr' valves.

Rather than rely on nameplates, or the valve type which could be either confusing or obscured by lagging, it is usual to adopt the convention that the upstream valve is the master valve which must be opened first, and most importantly, opened to its fullest extent (but not backseated). The downstream valve is the martyr valve which is initially 'cracked open' until the pipework has slowly warmed through and removed the risk of water hammer etc., when the valve can then be opened to regulate the flow as required. The martyr valve must be closed first, followed by the master valve.

Joining pipework - pairs of valves can be supplied with a joining piece of pipework welded and tested thereby simplifying site installation.

INSTALLATION

The valve must be positioned so that the handwheel etc. is easy to operate from a safe position. It is the end users responsibility to provide a safe working area, with adequate lighting and an unobstructed access, and that the position

indicator is easily visible. The valve and actuator must be suitably protected against falling objects, including rain etc., and must not be used for any purpose for which it was not designed e.g. it must not be used for standing on, securing, scaffolding, welding earth return etc.

Before installing, make sure all the protection has been removed from the valve and inspect it for any damage which might have occurred during either transit or handing. Ensure the pipework into which the valve is to be fixed is square and adequately supported and that it is clean and rust free with no debris which could affect subsequent valve operation. Use suitable lifting gear to support the valve for installing.

IMPORTANT

Valves must be installed the correct way in the pipelines! Master valves must be installed upstream of a martyr valve. All valves with V port or parallel port seats must be installed with the special seat to the downstream side of the valve. Pipework joining master and martyr valves must be at least 10 to 15 diameters of straight pipe and this length of straight pipe must be between any T, take-off from a main or a vessel, bend etc, to the first valve. These amounts may be reduced, say for instrument isolation duties, where there is no real flow.

Weld the valve into the pipeline using an approved procedure.

Wire up the electrical supply to any actuator with adequately sized cable (not in Weir Valves & Controls UK Ltd supply) taking care to allow for sufficient free movement of the valve through pipe deflections, thermal expansions etc. Only use approved electrical practices and ensure phases are correct and the valve runs in the correct direction. Before first running the valve electrically, position the valve at mid-travel by hand, then operate electrically, but be prepared to stop the actuator immediately by pressing the stop button if it runs in the wrong direction. Take appropriate action if the motor runs in the wrong direction.

Check that the actuator stops at the appropriate places i.e. that the run-down of the actuator stops before the valve backseats in the opening direction, and before the belt guide reaches the shoulders of the pillars in the closing direction. If it is required to alter any of the actuator settings, refer to the actuator information.

Once installed, the system must only be operated so that the valve assembly is not exposed to excess operating conditions, water hammer, water freezing, corrosion or abuse in any way whatsoever.

COMMISSIONING

The valve should be thermally insulated - "lagged" - to protect operators when the valve is hot, and also as an aid to reducing noise and conserving energy. Such insulation may be fitted during or after commissioning providing adequate safety measures are taken to prevent hazards from a hot valve.

Commissioning involves testing the valve and the system that it is in (e.g. hydraulic testing of the pipe to valve weld, the correct remote operation of the valve etc.), and then equipping the valve for the start of its operational life (e.g. charging up the system to the valve). During commissioning, it is sometimes necessary to bypass interlocks or safeguards on equipment in order to simulate meaningful commissioning trials. Under these circumstances, the utmost care must be exercised. As Weir Valves & Controls UK Ltd. has not been informed of any procedure which will either interfere with this valve in order to test other plant, or to interfere with other equipment to test this valve, it is the responsibility of the user to ensure the total safety of persons and equipment.

The following items may require to be attended to during commissioning, and it must be recognised that their mention here is on the strict understanding that measures will be taken to prevent any risk.

CHEMICAL CLEANING OF PIPELINES

If chemical cleaning has to be undertaken, ensure the chemicals are compatible with the materials in the valve. It is important to ensure that any chemicals used in this operation do not soak into the gland packing where they could promote corrosion of the valve stem and/or deterioration of the packing. For this reason, it is recommended that the valve is first pressurised with water to "saturate" the gland packing, operating the valve at the same time to promote this, and leaving the valve in the half-open position. Proceed with the chemical cleaning and passivation. Then with water in the valve, operate it several times to flush away any chemicals that may have penetrated the gland packing.

HYDRAULIC TESTING

Test only up to the maximum hydraulic test pressure for the valve rating. At shell test pressure the actuator is not designed to close the valve and also the gland packing is permitted to leak at this pressure. Check for other leaks, e.g. at valve to pipe connections.

Use corrosion inhibited water for testing.

NOTE - Shell test pressure is 1.5 times the "cold rating pressure" stated on the valve nameplate.

ELECTRICAL TESTING/FUNCTIONAL TESTING

Carry out full electrical testing and functional testing including earth continuity checks and ensure everything is working correctly. Isolate electrically before removing actuator covers

PREPARATION FOR OPERATION

Ensure that the actuator covers are secure with no possible ingress of water, moisture etc.

Set the valve in the position required for starting up the plant after bleeding through or draining as required any fluid appropriate to the commencement of operation.

Note that when the valve enters full and proper operation this may be the first time that the valve and actuator are subjected to the most arduous combination of conditions e.g. flow, temperature (including ambient temperature), pressure, operating loads, full load current on the actuator etc. It is therefore important that the valve is seen to operate correctly not only during "commissioning", but also when the valve has entered "operation". The same is true if the valve should be subjected to any changed conditions of operation.

COMMISSIONING AND OPERATIONAL PRECAUTIONS

In certain circumstances, it is possible that the valve is operated more frequently during commissioning than that which occurs during normal operation. Routine maintenance, overhaul, lubrication etc. may therefore still be necessary and it should not be assumed that these can be neglected during commissioning and early operation.

Internal damage to the valve can also occur during this period as weld spatter, pipe scale, debris etc. is still finding its way through the system pipework. Care should be taken to ensure that no damage is done to the valve during such times.

IMPORTANT NOTE: INTERGATE OVER PRESSURISATION

All double seated valves like parallel slide valves and wedge gate valves can be subjected to a series of events which causes over pressurisation of the intergate space. Such over pressurisation can be extremely damaging to valve components and dangerous to personnel, and must be avoided by strict operational procedures if the valve does not have its own 'automatic' vent.

Over pressurisation is caused when the intergate space contains some, or all liquid and is then subjected to heat. The expansion of the liquid causes extremely high pressures to be generated when this cavity is perfectly sealed.

The problem is prevented by bleeding away the pressure before it builds up, preferably by opening the bypass valve, or by opening the main valve.

An example of this problem is when after a hydraulic test steam is put on one side of the valve. The conducted heat causes the water to expand and this can produce conditions many times in excess of the valve rating. This is simply one example of many - various codes warn about exposure to solar heating for instance.

ROUTINE MAINTENANCE

The valve requires little routine maintenance. However, the valve should be externally inspected regularly, preferably whilst it is operating, to check for gland leakage, signs of seat wear or leakage etc., so that timely rectification work can be arranged. This inspection can also determine if additional lubrication is required where the valve stem screws into the actuator drive sleeve/handwheel drive sleeve.

The frequency of this inspection depends on the amount of use received by the valve, and thus it is recommended that a suitable inspection interval be taken as say six months, and that this interval is adjusted as necessary in the light of site experience.

Take care when approaching a valve, particularly if it is seen to be leaking at the gland, or if the valve has been backseated, refer Page 2 for details on backseating.

If the gland has been leaking then depressurise the system, isolate the actuator, and tighten the gland nuts. Glands benefit from early attention to stop leakage, or else a path through the gland packing will be cut which cannot be remedied by simply re-tightening the gland nuts. The gland nuts must not be over-tightened! Reconnect the electric supply, and re pressurise the system to test for gland leakage. If re-tightening the gland has not made it leak-tight then overhaul the valve in accordance with the dismantling and assembly procedure. Meanwhile it may be possible to operate the valve in its backseated position in order to minimise gland leakage.

To re-lubricate the stem thread make sure the valve is safe to work on, that the system is depressurised and that the electric supply to the actuator has been isolated. Apply one of the recommended lubricants (refer to Publication IOM G3 R0) to the exposed part of the spindle thread. Engage the actuator handwheel (refer to page 3 of this manual 'manual operation of actuators' if further details are needed) and operate the valve in order to work the lubricant into the actuator drive sleeve. Return the valve to the required position and return it to service.

IMPORTANT

After any maintenance ensure the actuator covers are properly in place before the valve is returned to service.

Refer to the actuator manufacturers recommendation for routine maintenance of the actuator.

If the gland has been leaking then depressurise the system, isolate the actuator, and tighten the gland nuts. Glands benefit from early attention to stop leakage, or else a path through the gland packing will be cut which cannot be remedied by simply re-tightening the gland nuts. The gland nuts must not be over-tightened! Reconnect the electric supply, and re pressurise the system to test for gland leakage. If re-tightening the gland has not made it leak-tight then overhaul the valve in accordance with page 6,7 & 8. Meanwhile it may be possible to operate the valve in its backseated position in order to minimise gland leakage.

DISMANTLING

These valves have been designed for quick and easy maintenance, and no special tools are required to dismantle them.

Before any dismantling work, ensure that the equipment is safe to work on, that the system has been depressurised and drained and that the actuator has been correctly isolated from any electrical supply. Do not rely on the selector switch on the actuator.

Ensure all site safety regulations, permit systems etc., are complied with, and take care if handrails or flooring has to be removed to gain access to the valve. Ensure adequate lighting and lifting facilities are available.

1. Open the valve.

2. Actuators:

Support the actuator. Remove the Hex head cap screws that secure the actuator to the adaptor plate (238). Turn handwheel in a clockwise "Closing", direction, simultaneously drawing the actuator away from the valve. When the actuator disengages from the end of the stem thread, do not turn the handwheel any further as this will simplify replacement (i.e. in the re-setting of limit switches). Place actuator in a safe position, taking care not to strain the actuator cables. If necessary, disconnect the electric cables. Remove the Hex head cap screws (643) and remove adaptor plate.

3. Handwheel operated:

Remove capscrews (643) holding the bridge (4) to the pillars (8). Turn handwheel in a closing (clockwise) direction which will allow the handwheel assembly to be removed as a single unit.

4. Remove pillars (8).

5. The stem guide (11) can now be removed from the stem/belt (19). Place small parts in a safe place. Note on some sizes, the stem guide is of split construction.

6. Remove gland stud nuts (522) in order to remove gland assembly: the gland (12), the gland cover (994), and the gland cleaning ring (2058).

7. Remove jacking screw (443), split ring (152), jacking plate (559) and cover.

8. Press bonnet (2) down so that it releases the load on the segmental locking ring. The bonnet may be tapped with a soft faced hammer (e.g. plastic or hide) to achieve this.

9. Remove segmental locking ring (926) as follows:

- a) Remove master segment. This is the shortest segment.
- b) Remove remaining segments.

10. The bonnet (2) complete with gasket (430), holding ring (424) and the belt assembly: the belt/stem (19), the disc spring (70) can be removed.

CAUTION - The discs and the spring will be free to drop once they are withdrawn from the seat space. Be prepared to take hold of the two discs and the spring to avoid them being damaged.

N.B. If repacking is required remove stem/belt from bonnet to enable the old gland packing to be removed easier.

To Remove Actuator without Dismantling Valve

Follow Items 1 and 2 detailed on Page 6 dismantling.

Examination and Course of Action

Carefully clean and examine all parts for damage, wear, corrosion etc., and replace or renovate all parts as necessary.

The seats and backseat should all be lapped independently. The "square" valve discs may, if required, be machined in a lathe prior to lapping if there are severe wear marks otherwise do not interfere with them. The special titanium nitride coating is thin and must only be lapped or machined if a new part is not available. If necessary, use the best disc against the downstream seat. If the discs are machined, it is most important that the smooth radii on the inside and outside diameters of the seating face are replaced. Information on lapping the seating faces is given in Publication IOM 1 R0. After a total of 0.8mm (1/32") has been removed from a sealing face it must be replaced.

For details concerning the actuator, refer to the actuator information.

PRINCIPLE OF THE PRESSURE SEALED GASKET

This method of affecting a pressure-tight joint does not rely on the tension in bolts or studs to create a seal.

A joint is made by the wedging action of the bonnet (2) against the gasket, which in turn deforms slightly to make a fluid tight seal against the body face joint. The initial contact is made by tightening the jacking screws, thereby pulling the bonnet against the gasket. Fluid pressure when applied forces the bonnet further into the bore of the gasket and the higher the pressure, the greater the intensity of the joint load. Outward movement of the gasket is prevented by the segmental locking ring (926).

During overhaul, visual inspection of the gasket faces of the body and bonnet will reveal any major defects immediately. The actual joint is made primarily on the joint gasket inner face and the outside surface. If the valve has been leaking from the pressure seal and the following up of the adjusting screws proves unsuccessful, then it will be found that the trouble is either the body joint face or the bonnet joint face. Unless leakage has been allowed to take place over a prolonged period, the damage to these faces will be slight and in most cases can be corrected by polishing with fine emery cloth.

The bonnet may be machined in a lathe if it is badly damaged, provided that the original joint angles are maintained. It is unnecessary to remove every mark from the bonnet as the gasket will seal against minor blemishes. The diameter of the gasket sealing face must not be reduced by more than 0.5mm in total. If it is necessary, the bonnet must be replaced.

ASSEMBLY

Assembly is generally a reverse of the dismantling procedure.

Ensure that all parts are clean. The disc and spring should be correctly located in the belt assembly and entered into the valve body as far as the top of the seats with one disc already entered. Using a wood lever or some other such instrument, carefully move back the free disc so that the assembly enters the space between the seats. The lever must only be used on the centre of the

disc, and care taken not to damage the sealing faces.

Position the bonnet over the stem and into the body.

Fit the gasket, and push it into place using the holding ring.

Fit segmental ring in the correct sequence with locking segment last.

The bonnet can be lifted up to lock the segmental ring in place. Fit cover, jacking plate, split ring and

jacking screws. The next operation, which is to repack the gland, is very important.

The gland must be repacked so that the stem is absolutely concentric. This is important for both gland tightness and to prevent the scoring of the stem as it passes through the gland. New packings are therefore recommended.

The first portion of "packing" is braided packing ring (61) which will be supplied long. Cut this to the required length just prior to fitting, as this will avoid damage or unravelling of the braid. The ends should be cut square (there is no need to scarf or mitre the ends) but is imperative that the braid is not cut short. Fit the braid followed by the exfoliated graphite packing rings (921). The rings (921) are die pressed circular rings which will help centralise the stem. The last portion of "packing" is another braided packing ring (61) prepared as described above.

Fit the gland (12), the cleaning ring (2058), the gland cover (994) and gland stud nuts (522). Tighten the gland stud nuts (522) evenly, a small amount at a time so as to keep the stem centralised.

Proceed to build up the valve by replacing the stem guide to its previous position and fitting pillars. When refitting the handwheel assembly or the actuator, offer it up to the bare end of the stem thread. The stem may be lubricated with grease at this point (refer to Publication IOM G3 R0). Rotate the actuator/handwheel anti-clockwise to engage it on the stem.

Provided the actuator is engaged in exactly the same relation to the stem, then its limit switches will not require resetting, but must be checked to confirm this.

Complete the refitting of the handwheel assembly or actuator to the valve. Instigate safe conditions to hydraulically test the valve and adjust the gland packing to be leak-tight at pressures up to 1.1 times the designed operating pressure. It may be beneficial to check the operation of the actuator by reference to the position of the belt guide (11) before replacing the actuator covers. Replace the covers before operating the actuator electrically. When complete make a complete check of the operation of the valve and actuator (refer to Pages 3 & 4 Installation and Commissioning). Take care whilst actuator covers are open.

Reinstate the job-site to safe working conditions, e.g. remove lifting tackle, replace flooring, handrails, etc. cancel permits.

For actuator assembly checking and re-setting refer to the actuator information.

For faults not specifically covered, e.g. "blown" fuses, follow the accepted safe methods of investigation and rectification.

IF IN DOUBT ASK!

Consult Weir Valves & Controls UK Ltd if anything is not clear. Safe working practices must prevail at all times.

Seat & Disc Arrangement in Lap

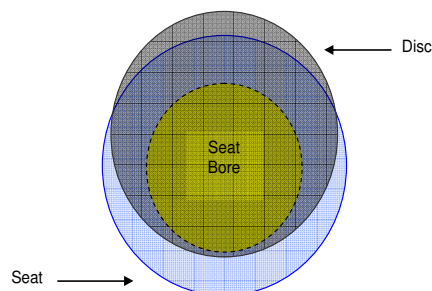


Figure 1

Weir Valves & Controls

Hopkinsons Valves

Operation & Maintenance Instruction

HIGH PERFORMANCE PARALLEL SLIDE VALVES

WITH TYPICAL ARRANGEMENT DRAWINGS 21577/18, 21578/18



IOM-P3-R0

21577/18

IF IN DOUBT ASK

PART SECTION SHOWING
CORRECT POSITION
OF PILLARS, GLAND, ETC.

DETAIL OF BELT,
SEAT AND DISC.

SECTION ON 'A'-'A'

WEIGHT = 48Kg

DO NOT SCALE

DATE 9-7-97 SCALE -1-1-

DRAWN AUS CHECKED AA

TRACED -

REF	NAME OF PART	NO. OFF	MATERIAL
1	BODY	1	ASTM A217-NC9
2	PRESSURE SEALED BONNET	1	ASTM A182-F22
3	HANDWHEEL	1	BS1452 GR.180
4	BRIDGE	1	BS4360 GR.43A
8	PILLAR	2	BS970-070 M20
11	BELT GUIDE	1	BS970-070 M20
12	GLAND STUD	1	BS146 NCI GR.B
13	GLAND STUD	2	ASTM A193 Gr. B7
17	BONNET BUSH	1	N1 Mo ALLOY
18	BELT GUIDE NUT	1	BS970-070 M20
19	BELT	1	BS970 321 S31
21	SLEEVE	1	BS2874-CA104
25	SEAT (WINGED)	2	Co. Cr. ALLOY
26	GATE (MALE & FEMALE) 11	PR. 11	PR. 11
54	NEEDLE BEARING	2	STEEL
57	GRUBSCREW	1	BS2470
58	LUBRICATOR	1	STEEL
61	PACKING RING	2	BRAIDED GRAPHITE
70	DISC SPRING	1	NIMONIC '90'
137	CAP NUT	1	BS970-070-M20
152	SPLIT RING	1	BS3146-NC1 GR.B
156	SLEEVE KEY	1	BS4235 PT
200	COVER	1	BS3146 NCI GR B
295	IDENTIFICATION PLATE	1	BS1470-S1
424	HOLDING RING	1	BS970 420 S29
430	GASKET	1	EXFOLIATED GRAPHITE
443	JACKING SCREW	2	BS2470
522	GLAND STUD NUT	2	ASTM A194 Gr. 7
559	JACKING PLATE	1	BS3146 NCI GR.B
629	TENSION PIN	1	BS1449 CS70
643	CAP SCREW	2	BS2470
926	PACKING RING	4	EXFOLIATED GRAPHITE
926	LOCKING RING	1	ASTM A638 660
994	GLAND COVER	1	BS1449 CR4
2058	CLEANING RING	1	REINFORCED GLASS FIBRE

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HOPKINSONS

HIGH PERFORMANCE PARALLEL SLIDE GATE VALVE FOR DRAIN VALVE DUTIES

32mm NOM. BORE FIGURE M268520W

DRAWING NO. 21577

18

Weir Valves & Controls

Hopkinsons Valves

Operation & Maintenance Instruction

HIGH PERFORMANCE PARALLEL SLIDE VALVES

WITH TYPICAL ARRANGEMENT DRAWINGS 21577/18, 21578/18



IOM-P3-R0

