

APCO AVC-140C/150C COMBINATION AIR VALVES



Instruction **D12008**
June 2014

Instructions

These instructions are for use by personnel who are responsible for the installation, operation and maintenance of DeZURIK valves, actuators or accessories.

Safety Messages

All safety messages in the instructions are identified by a general warning sign and the signal word CAUTION, WARNING or DANGER. These messages indicate procedures to avoid injury or death.

Safety label(s) on the product indicate hazards that can cause injury or death. If a safety label becomes difficult to see or read, or if a label has been removed, please contact DeZURIK for replacement label(s).

⚠WARNING

Personnel involved in the installation or maintenance of valves should be constantly alert to potential emission of pipeline material and take appropriate safety precautions. Always wear suitable protection when dealing with hazardous pipeline materials. Handle valves which have been removed from service with suitable protection for any potential pipeline material in the valve.

Inspection

Your DeZURIK product has been packaged to provide protection during shipment; however, items can be damaged in transport. Carefully inspect the unit for damage upon arrival and file a claim with the carrier if damage is apparent.

Parts

Replaceable wear parts are listed on the assembly drawing. These parts can be stocked to minimize downtime. Order parts from your local DeZURIK sales representative or directly from DeZURIK. When ordering parts please provide the following information:

If the valve has a data plate: please include the 7-digit part number with either 4-digit revision number (example: 9999999R000) or 8-digit serial number (example: S1900001) whichever is applicable. The data plate will be attached to the valve assembly. Also, include the part name, the assembly drawing number, the balloon number and the quantity stated on the assembly drawing.

If there isn't any data plate visible on the valve: please include valve model number, part name, and item number from the assembly drawing. You may contact your local DeZURIK Representative to help you identify your valve.

DeZURIK Service

DeZURIK service personnel are available to maintain and repair all DeZURIK products. DeZURIK also offers customized training programs and consultation services. For more information, contact your local DeZURIK sales representative or visit our website at DeZURIK.com.

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This Drinking Water System Component is tested and certified by WQA against NSF/ANSI Standard 61.

Description

Combination Air Valves have operating features of both Air/Vacuum Valves and Air Release Valves. These valves are also called Double Orifice Valves. Combination Air Valves are available in two body styles; a Single Body Combination and a Custom Built Combination with two (2) bodies.

The AVC-140C and AVC-150C are Single Body Combination valve and are used where compactness is preferred and/or where risk of tampering exists due to accessibility of the installation. This style is available from 1" thru 8" sizes.

Handling and Storage

Lifting the valve improperly may damage it. Do not fasten lifting devices to piping or attached components. Lift the valve with slings, chains or cables fastened around the valve body, or fastened to bolts or rods through bolt holes in the flanges.

If installation will be delayed, place valve indoors in secure, weather tight storage. If temporary outside storage is unavoidable, make sure a vermin proof rain cover (water shedding tarp, etc.) is secured around/over the valve to keep off rain and mud. Skid and set the assembly on a flat, solid, and well drained surface for protection from ground moisture, runoff and pooled rain water.

Installation

Combination Air Valves are installed on all high points of a system where it has been determined Air/Vacuum and Air Release valves are needed to vent and protect a pipeline.

- Before installation, remove foreign material such as weld spatter, oil, grease, and dirt from the pipeline.
- Prepare pipe ends and install valves in accordance with the pipe manufacture's instructions for the joint used.



CAUTION!

Do not deflect the pipe-valve joint. Minimize bending stresses in the valve end connection with pipe loading.

- Tighten the flange bolts or studs in a crisscross pattern and minimum of four stages.

Fusion/Powder Coated Valves



CAUTION!

Valves with fusion/powder coated exterior paint require flat washers to be installed under the flange nuts when installing the valve to the pipeline flange to prevent the paint from cracking or chipping.

Maintenance

Combination Air Valves are automatic in operation and require very little or no maintenance. It is recommended that they be checked visually semi-annually for leakage. A malfunction of the valve will be evident by leakage of the media out of the orifice of plug stem or by the seating area of the exhaust port. Should a malfunction occur, the following steps should be taken to repair the valve:

Cleaning of Seat Orifice

See Figure 1 and Figure 2 for part identification.



WARNING!

Servicing the Air Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air Valve.

- Relieve pipeline pressure or shut off isolation valve at inlet to Air Valve.
- Loosen pipe plug on body (1) to relieve pressure.
- Remove pipe plug.
- Using air or water, blow down into valve to clean any sediment that may be preventing needle (7) from seating properly to orifice of plug (42) and plug seating to seat (6).
- Replace pipe plug.
- Open isolation valve on inlet to Air Valve. Valve is now back in service. If this procedure has not remedied the problem, proceed with disassembly.

Disassembly Procedure

See Figure 1 and Figure 2 for part identification.



WARNING!

Servicing the Air Valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the Air Valve.

1. Relieve pipeline pressure or shut off isolation valve at inlet to Air Valve.
2. Loosen pipe plug to relieve pressure in Air Valve.
3. Remove pipe plug.
4. Remove cover bolts (4) and cover (2) from valve body (1). **Note:** All internals are attached to the cover.
5. If cover gasket (3) is torn or damaged, clean flange surfaces of cover (2) and body (1).
6. Remove leverage screws (16) and remove assembly from cover (2).
7. Inspect large seating surface of plug (42) and seat (6) for nicks, wear or sediment coating from chemicals in the media.

Maintenance *(Continued)*

8. Inspect seating surface of needle (7) and orifice seat end of plug (42) for same conditions.
9. Inspect surface conditions between seat (6) and cover (2) for possible rust build-up.
10. Inspect all connections of linkage for excessive wear or damage.
11. Inspect float (14) to insure that it is not damaged or that it does not have liquid in it.
12. Check bumper (40) for wear or damage.
13. Thoroughly clean all parts and body.

Assembly Procedure

See Figure 1 and Figure 2 for part identification.

1. Install new needle (7) in float lever (13), if necessary.

Install new seat (6), if necessary. If line pressure is below 10 PSI and a positive closing cannot be achieved, contact the factory for recommendations for a softer Durometer Buna-N seat.

2. Reassemble linkage assembly, replacing pin (10) and retaining rings (11), as necessary.
Note: Only factory approved and/or factory supplied stainless steel parts should be used.
3. Assemble leverage frame (6) assembly to cover (2). Be sure that plug (42) moves freely from its open to closed position and the plug sits square and flat on seat (6). Improper positioning of leverage frame to cover before tightening screws can result in binding of plug.
4. Assemble cover (2) to body (1), installing new gasket (3) if necessary. Tighten bolts (4) opposite each other in rotation.
5. Install and tighten pipe plug.
6. Open isolation valve at inlet of Air Valve slowly and observe the closing of plug coming up to and seating with Buna-N seat. Except for a very slight spurt of liquid at closing, a positive seal should result.

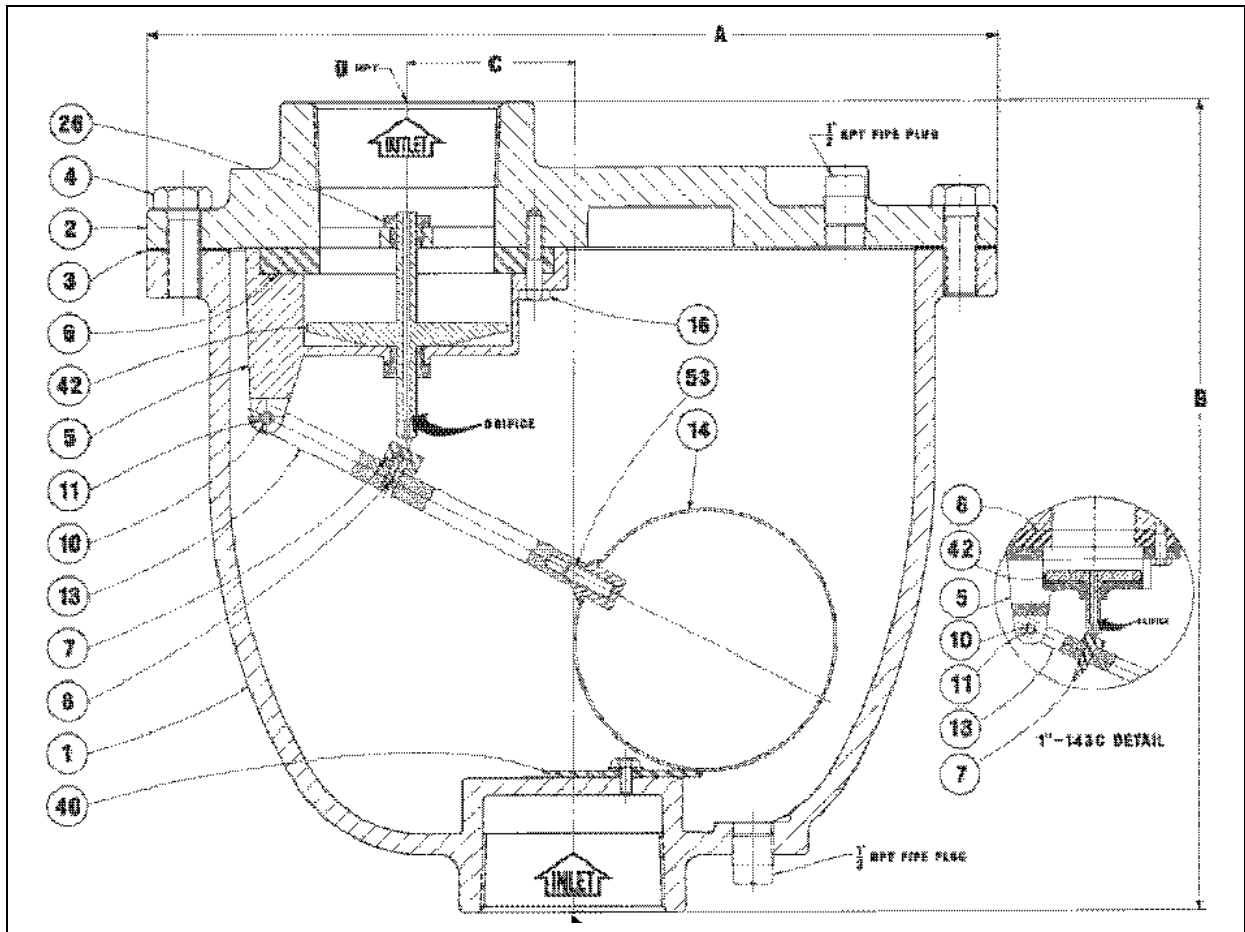
Operation

Combination Air Valves prevent accumulation of air at high points within a system by exhausting large volumes of air as the system is filled and releasing accumulated pockets of air while the system is operational and under pressure. They also prevent potentially destructive vacuums from forming by admitting large quantities of air into the system. This can occur during power outage, water column separation or sudden rupture of the pipeline. Additionally, these valves allow the system to be easily drained because air will re-enter as needed.

DeZURIK

APCO AVC-140C/150C Combination Air Valves

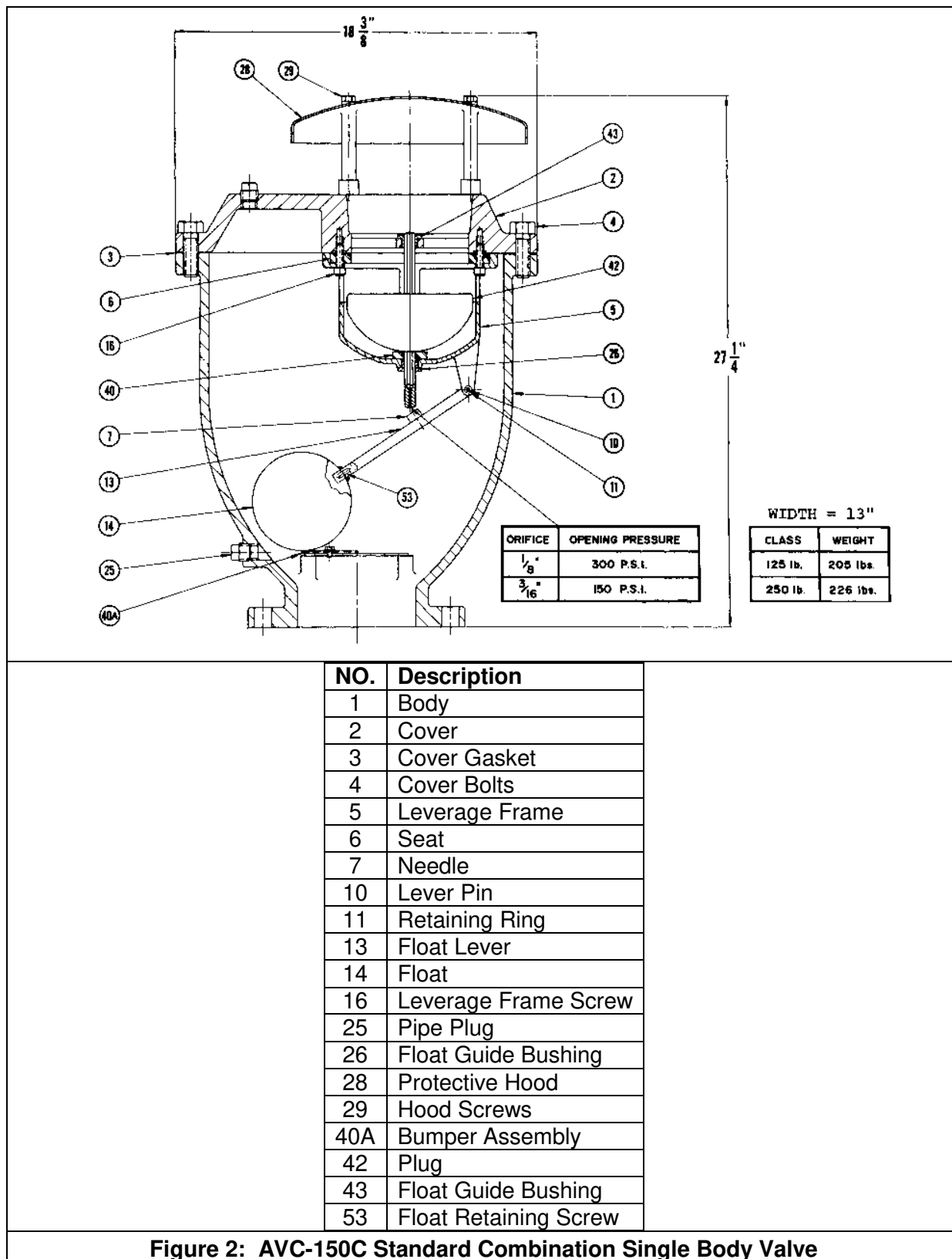
Drawings



NO.	Description
1	Body
2	Cover
3	Cover Gasket
4	Cover Bolts
5	Leverage Frame
6	Seat
7	Needle
8	Needle Pin
10	Lever Pin
11	Retaining Ring
13	Float Lever
14	Float
16	Leverage Frame Screw
26	Guide Bushing
40	Bumper Assembly
42	Plug
53	Float Retaining Screw

Figure 1: AVC-140C Standard Combination Single Body Valve

Drawings (Continued)



Troubleshooting

Condition	Possible Cause	Corrective Action
Valve leaks at flange joint.	Loose flange bolting.	Tighten flange bolting.
	Blown flange gasket.	Replace flange gasket.
	Miss-alignment or damage to field piping and supports.	Adjust miss-alignment or repair piping or supports.
	Damaged flange face/s or improper flange connections.	Repair flange, replace valve body or adjust flange connections.
Valve leaks out of Outlet port.	Dirty seat and/or plug.	Clean seat and/or plug.
	Worn seat and/or plug.	Replace seat and/or plug.
	Line pressure is under 10 psi.	Replace seat with softer seat.
	Dirty needle and/or orifice of plug.	Clean needle and/or orifice of plug.
	Worn needle and/or orifice of plug.	Replace needle and/or plug.
	Plug does not move freely.	Re-adjust position of leverage frame to cover.
	Float has liquid in it.	Replace float.

Limited Warranty

DeZURIK, Inc. ("Seller") manufactured products, auxiliaries and parts thereof that we manufacture for a period of twenty-four (24) months from date of shipment from Seller's factory, are warranted to the original purchaser only against defective workmanship and material, but only if properly stored, installed, operated, and serviced in accordance with Seller's recommendations and instructions.

For items proven to be defective within the warranty period, your exclusive remedy under this limited warranty is repair or replacement of the defective item, at Seller's option, FCA Incoterms 2020 Seller's facility with removal, transportation, and installation at your cost.

Products or parts manufactured by others but furnished by Seller are not covered by this limited warranty. Seller may provide repair or replacement for other's products or parts only to the extent provided in and honored by the original manufacturer's warranty to Seller, in each case subject to the limitations contained in the original manufacturer's warranty.

No claim for transportation, labor, or special or consequential damages or any other loss, cost or damage is being provided in this limited warranty. You shall be solely responsible for determining suitability for use and in no event shall Seller be liable in this respect.

This limited warranty does not warrant that any Seller product or part is resistant to corrosion, erosion, abrasion or other sources of failure, nor does Seller warrant a minimum length of service.

Your failure to give written notice to us of any alleged defect under this warranty within twenty (20) days of its discovery, or attempts by someone other than Seller or its authorized representatives to remedy the alleged defects therein, or failure to return product or parts for repair or replacement as herein provided, or failure to store, install, or operate said products and parts according to the recommendations and instructions furnished by Seller shall be a waiver by you of all rights under this limited warranty.

This limited warranty is voided by any misuse, modification, abuse or alteration of Seller's product or part, accident, fire, flood or other Act of God, or your failure to pay entire contract price when due.

The foregoing limited warranty shall be null and void if, after shipment from our factory, the item is modified in any way or a component of another manufacturer, such as but not limited to; an actuator is attached to the item by anyone other than a Seller factory authorized service personnel.

All orders accepted shall be deemed accepted subject to this limited warranty, which shall be exclusive of any other or previous warranty, and this shall be the only effective guarantee or warranty binding on Seller, despite anything to the contrary contained in the purchase order or represented by any agent or employee of Seller in writing or otherwise, notwithstanding, including but not limited to implied warranties.

THE FOREGOING REPAIR AND REPLACEMENT LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, OBLIGATIONS AND LIABILITIES, INCLUDING, BUT NOT LIMITED TO, ALL WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR OF MERCHANTABILITY OR OTHERWISE, EXPRESSED OR IMPLIED IN FACT OR BY LAW, AND STATE SELLER'S ENTIRE AND EXCLUSIVE LIABILITY AND YOUR EXCLUSIVE REMEDY FOR ANY CLAIM IN CONNECTION WITH THE SALE AND FURNISHING OF SERVICES, GOODS OR PARTS, THEIR DESIGN, SUITABILITY FOR USE, INSTALLATION OR OPERATIONS. NEITHER ANY PERFORMANCE OR OTHER CONDUCT, NOR ANY ORAL OR WRITTEN INFORMATION, STATEMENT, OR ADVICE PREPARED BY SELLER OR ANY OF OUR EMPLOYEES OR AGENTS WILL CREATE A WARRANTY, OR IN ANY WAY INCREASE THE SCOPE OR DURATION OF THE LIMITED WARRANTY.

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Metric fasteners should not be used with ASME Class 150/300 bolt holes and flange bolt patterns. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, it may lead to product failure, injury, and loss of life. DeZURIK Inc. disclaims all liability associated with the use of metric fasteners with ASME Class 150/300 bolt holes and flange patterns, including but not limited to personal injury, loss of life, loss of product, production time, equipment, property damage, lost profits, consequential damages of any kind and environment damage and/or cleanup. Use of metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns is a misuse that voids all warranties and contractual assurances. If you use metric fasteners with ASME Class 150/300 bolt holes and flange bolt patterns, you do so at your sole risk and any liability associated with such use shall not be the responsibility of DeZURIK, Inc. In addition to the foregoing, DeZURIK's Manufacturer's Conditions apply.

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IN NO EVENT SHALL SELLER BE LIABLE FOR ANY DIRECT, INDIRECT, SPECIAL, PUNITIVE, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO; DAMAGE TO OR LOSS OF OTHER PROPERTY OR EQUIPMENT, BUSINESS INTERRUPTION, COST OF SUBSTITUTE PRODUCTS, LOSS OF TIME, LOSS OF PROFITS OR REVENUE, COST OF CAPITAL, LOSS OF USE, OR DIMINUTION IN VALUE) WHATSOEVER, AND SELLER'S LIABILITY, UNDER NO CIRCUMSTANCES, WILL EXCEED THE CONTRACT PRICE FOR THE GOODS AND/OR SERVICES FOR WHICH LIABILITY IS CLAIMED. ANY ACTION FOR BREACH OF CONTRACT BY YOU, OTHER THAN RIGHTS RESPECTING OUR LIMITED WARRANTY DESCRIBED ABOVE, MUST BE COMMENCED WITHIN 12 MONTHS AFTER THE DATE OF SALE.

Sales and Service

For information about our worldwide locations, approvals, certifications and local representative:

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Design features, materials of construction and dimensional data, as described in this manual, are provided for your information only and should not be relied upon unless confirmed in writing by DeZURIK, Inc. Certified drawings are available upon request.