



**Fundusze Europejskie**  
Infrastruktura i Środowisko



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|                                                                                                                                    |                            |                           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
|------------------------------------------------------------------------------------------------------------------------------------|----------------------------|---------------------------|-----------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------|--------------------|------------|-----------------|-------------|----------------------|-----------------|---------------------|
| A0B                                                                                                                                | 12.03.2024                 | Schüler                   | Feldmann              | Langanke                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | As-Built                                                                |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| 00A                                                                                                                                | 11.08.2022                 | Schüler                   | Feldmann              | Exner                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | For Construction                                                        |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| 001                                                                                                                                | 22.04.2022                 | Schüler                   | Feldmann              | Exner                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | For Review                                                              |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| 000                                                                                                                                | 29.12.2021                 | Schüler                   | Feldmann              | Exner                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | For Review                                                              |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| REWIZJA<br>REVISION                                                                                                                | DATA<br>DATE               | ZAPROJEKTOWAŁ<br>DESIGNED | SPRAWDZIŁ<br>REVIEWED | ZATWIERDZIŁ<br>RELEASED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | OPIS ZMIAN/CEL WYDANIA<br>DESCRIPTION OF CHANGE/ RELEASE PURPOSE/STATUS |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
|                                                   |                            |                           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                         |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
|                                                                                                                                    | Odniesienie/<br>References | Data/<br>Date             | Plik/<br>File         | <p align="center"><b>PROJEKT/ PROJECT</b></p> <p>Budowa instalacji termicznego przekształcania frakcji energetycznej z odpadów pochodzących z odpadów komunalnych, z odzyskiem energii elektrycznej i ciepłej wraz z infrastrukturą towarzyszącą</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                         |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| Rysunek<br>nowy/<br>Drawn                                                                                                          |                            |                           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| Sprawdzenie/<br>Checked                                                                                                            |                            |                           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| Zatwierdzony/<br>Approved                                                                                                          |                            |                           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| <p>Logo dostawcy<br/>Contractor logo</p>        |                            |                           |                       | <p align="center"><b>Tytuł dokumentu/ Document title</b></p> <p align="center">Arkusz Danych - Zawór</p> <p align="center">Zawór regulacyjny pary przegrzanej do wymiennika ciepła gaz/para<br/>11 LBG20 AA001</p> <p align="center">Data Sheet - Valve</p> <p align="center">Superheated Steam Control Valve To Gas/Steam Heat Exchanger<br/>11 LBG20 AA001</p> <table border="1"> <tr> <td>PROJEKT<br/>PROJECT</td> <td>DOSTAWCA<br/>ISSUER</td> <td>KKS<br/>KKS</td> <td>POZIOM<br/>LEVEL</td> <td>TYP<br/>TYPE</td> <td>BRANŻA<br/>DISCIPLINE</td> <td>NUMER<br/>NUMBER</td> <td>REWIZJA<br/>REVISION</td> </tr> </table> <p align="center"><b>ITP-AVS-UHA10-XX-DS-MEC-0007-A0B</b></p> <p align="center"><b>A.12016-11-03118-HDS-AVS-0007-01</b></p> |                                                                         |                                        | PROJEKT<br>PROJECT                                    | DOSTAWCA<br>ISSUER | KKS<br>KKS | POZIOM<br>LEVEL | TYP<br>TYPE | BRANŻA<br>DISCIPLINE | NUMER<br>NUMBER | REWIZJA<br>REVISION |
| PROJEKT<br>PROJECT                                                                                                                 | DOSTAWCA<br>ISSUER         | KKS<br>KKS                | POZIOM<br>LEVEL       | TYP<br>TYPE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | BRANŻA<br>DISCIPLINE                                                    | NUMER<br>NUMBER                        | REWIZJA<br>REVISION                                   |                    |            |                 |             |                      |                 |                     |
| <p align="center">Dokumentacja Powykonawcza<br/>As-Built</p>                                                                       |                            |                           |                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                         |                                        |                                                       |                    |            |                 |             |                      |                 |                     |
| <p>Logo poddostawcy<br/>Subcontractor logo</p>  |                            |                           |                       | <p>DATA/DATE<br/>DD/MM/RRRR</p> <p align="center">29/12/2021</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | <p>SKALA/SCALE<br/>Eplot</p> <p align="center">1:1</p>                  | <p>Format</p> <p align="center">A4</p> | <p>ARKUSZ/<br/>SHEET</p> <p align="center">1 of 3</p> |                    |            |                 |             |                      |                 |                     |

# Control Valve



ARTES Valve & Service GmbH  
Parkallee 7 - 16727 Velten  
GERMANY

A MEMBER OF THE ARCA FLOW GROUP

|    |                                                                                              |                   |                                              |                                              |                       |                                 |              |
|----|----------------------------------------------------------------------------------------------|-------------------|----------------------------------------------|----------------------------------------------|-----------------------|---------------------------------|--------------|
| 1  | Customer: Doosan Lentjes GmbH                                                                |                   |                                              | ARTES-ref.-no.: 5504341                      |                       |                                 |              |
| 2  | Plant: A.12016 - Olsztyn WTE                                                                 |                   |                                              | Pos.: 6                                      |                       |                                 |              |
| 3  | Location: Superheated Steam Control Valve To Gas/Steam Heat Exchanger                        |                   |                                              | Qty.: 1                                      |                       |                                 |              |
| 4  | KKS No.: 11 LBG20 AA001                                                                      |                   |                                              | S/N: 3171288.1                               |                       |                                 |              |
| 5  | Pipe - Connection Data                                                                       |                   |                                              | Inlet                                        |                       | Outlet                          |              |
| 6  | Dimensions                                                                                   | Ø D [mm] x s [mm] | 48,3                                         | x                                            | 4,5                   | 48,3                            | x 4,5        |
| 7  | Material                                                                                     |                   | 1.5415 (16Mo3)                               |                                              | 1.5415 (16Mo3)        |                                 |              |
| 8  | Welding Connection                                                                           | Ø D [mm] x s [mm] | 48,3                                         | x                                            | 4,5                   | 48,3                            | x 4,5        |
| 9  | Flange Connection                                                                            |                   | --                                           |                                              | --                    |                                 |              |
| 10 | Valve - Design Data                                                                          |                   |                                              | Inlet                                        |                       | Outlet                          |              |
| 11 | Nominal Size                                                                                 | DN / NPS          | 40                                           |                                              | 40                    |                                 |              |
| 12 | Nominal Pressure                                                                             | PN / class        | 160                                          |                                              | 160                   |                                 |              |
| 13 | Design Pressure                                                                              | bar(g)            | 82                                           |                                              | 82                    |                                 |              |
| 14 | Design Temperature                                                                           | °C                | 365                                          |                                              | 365                   |                                 |              |
| 15 | Material                                                                                     |                   | 1.5415 (16Mo3, 15Mo3)                        |                                              | 1.5415 (16Mo3, 15Mo3) |                                 |              |
| 16 | Operation Data                                                                               |                   | Loading Case                                 | Loading Case                                 | Loading Case          | Loading Case                    | Loading Case |
| 17 | Medium:                                                                                      | Water/Steam       | 1                                            | 2                                            | 3                     | 4                               | 5            |
| 18 | Phase                                                                                        |                   | steam                                        | steam                                        | steam                 |                                 |              |
| 19 | Flow Rate                                                                                    | kg/s              | 0,65                                         | 0,86                                         | 0,10                  |                                 |              |
| 20 | Temperature, Inlet                                                                           | °C                | 315,60                                       | 365,00                                       | 299,30                |                                 |              |
| 21 | Pressure, Inlet                                                                              | barA              | 72,30                                        | 83,00                                        | 48,60                 |                                 |              |
| 22 | Pressure, Outlet                                                                             | barA              | 53,10                                        | 60,00                                        | 47,50                 |                                 |              |
| 23 | k <sub>v</sub>                                                                               | m³/h              | 3,41                                         | 4,13                                         | 2,48                  |                                 |              |
| 24 | Flow Speed, Outlet                                                                           | m/s               | 22,0                                         | 29,3                                         | 4,09                  |                                 |              |
| 25 | Type Of Valve Control Ball Valve Type W                                                      |                   |                                              |                                              |                       |                                 |              |
| 26 | Valve Parameter                                                                              |                   |                                              |                                              | Material              |                                 |              |
| 27 | Seat Diameter:                                                                               | 25                | mm                                           | Body: 1.5415 (16Mo3, 15Mo3)                  |                       |                                 |              |
| 28 | Pressure Reduction Steps, controlled:                                                        | 1                 | Seating: 1.4122 (X39CrMo17-1), metal sealing |                                              |                       |                                 |              |
| 29 | Pressure Reduction Steps, fix:                                                               |                   | Ball: 1.4122 (X39CrMo17-1), metal sealing    |                                              |                       |                                 |              |
| 30 | k <sub>vs</sub>                                                                              | 5                 | m³/h                                         | Control disc: 1.4122 (X39CrMo17-1), hardened |                       |                                 |              |
| 31 | Control Characteristic:                                                                      | linear            | Seals: Graphite                              |                                              |                       |                                 |              |
| 32 | max. dp for Actuator:                                                                        | 82                | bar                                          |                                              |                       |                                 |              |
| 33 | Installation Length:                                                                         | 200               | mm                                           |                                              |                       |                                 |              |
| 34 |                                                                                              |                   |                                              |                                              |                       |                                 |              |
| 35 | Design / Inspection                                                                          |                   |                                              |                                              |                       | Final Inspection                |              |
| 36 | Pressure Equipment Directive 2014/68/EU                                                      |                   |                                              |                                              |                       | Confirmation acc. to DIN EN 3.1 |              |
| 37 | Requirements acc. to: EN 12952                                                               |                   |                                              |                                              |                       | 10204                           |              |
| 38 | Leckageklasse: 0,01% of kvs-Value                                                            |                   |                                              |                                              |                       |                                 |              |
| 39 |                                                                                              |                   |                                              |                                              |                       |                                 |              |
| 40 | Actuator pneumatic 3170823                                                                   |                   |                                              |                                              |                       |                                 |              |
| 41 | Type: ProtACT PR134D; double-acting "rack&pinion"; signal/air failure: "Fail-in-Place"       |                   |                                              |                                              |                       |                                 |              |
| 42 | Positioner Sipart PS2 6DR5120-0NG31-0AF0, 2-wire connection & HART-interface,                |                   |                                              |                                              |                       |                                 |              |
| 43 | ly-module (6DR4004-8J) for position-feedback (4...20mA)                                      |                   |                                              |                                              |                       |                                 |              |
| 44 | air set P172CEACP G3/8", adapter G3/8"-G1/4", piping SST, 2 limit switches with junction box |                   |                                              |                                              |                       |                                 |              |
| 45 | min. air supply pressure: 4,5 bar(g)                                                         |                   |                                              |                                              |                       |                                 |              |
| 46 | Actuatoradaption: EN ISO 5211 - F10 - square 27 mm                                           |                   |                                              |                                              |                       |                                 |              |
| 47 | Remarks                                                                                      |                   |                                              |                                              |                       |                                 |              |
| 48 |                                                                                              |                   |                                              |                                              |                       |                                 |              |
| 49 |                                                                                              |                   |                                              |                                              |                       |                                 |              |
| 50 |                                                                                              |                   |                                              |                                              |                       |                                 |              |
| 51 |                                                                                              |                   |                                              |                                              |                       |                                 |              |
| 52 | Body Strength Test - Test Pressure: p'= 172 bar - Test Medium: Water                         |                   |                                              |                                              |                       |                                 |              |
| 53 | Revision                                                                                     | 0                 | 1                                            | 2                                            | 3                     | 4                               | 5            |
| 54 | Date:                                                                                        | 03.11.2021        | 27.12.2021                                   | 27.01.2022                                   | 22.04.2022            | 11.08.2022                      |              |
| 55 | Prepared:                                                                                    | H. Roßmann        | P. Schüler                                   | D. Hermann                                   | P. Schüler            | P. Schüler                      |              |
| 56 | Checked:                                                                                     | H. Jäkel          | R. Feldmann                                  | P. Schüler                                   | R. Feldmann           | M. Majewski                     |              |

# Zawór regulacyjny



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|    |                                                                                   |                                                                                                                                                    |                       |                      |                      |                               |                                          |
|----|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|----------------------|----------------------|-------------------------------|------------------------------------------|
| 1  | Klient:                                                                           | Doosan Lentjes GmbH                                                                                                                                | Nr ref. ARTES:        |                      | 5504341              |                               |                                          |
| 2  | Zakład:                                                                           | A.12016 - Olsztyn WTE                                                                                                                              | Pos.:                 |                      | 6                    |                               |                                          |
| 3  | Lokalizacja:                                                                      | Zawór regulacyjny pary przegrzanej do wymiennika ciepła gaz/para                                                                                   | Ilość:                |                      | 1                    |                               |                                          |
| 4  | KKS Nr.:                                                                          | 11 LBG20 AA001                                                                                                                                     | Nr seryjny:           |                      | 3171288.1            |                               |                                          |
| 5  | Przewód rurowy - parametry połączeń                                               |                                                                                                                                                    | Włot                  |                      |                      | Wylot                         |                                          |
| 6  | Wymiary                                                                           | Ø D [mm] x s [mm]                                                                                                                                  | 48,3                  | x                    | 4,5                  | 48,3                          | x 4,5                                    |
| 7  | Materiał                                                                          |                                                                                                                                                    | 1.5415 (16Mo3)        |                      |                      | 1.5415 (16Mo3)                |                                          |
| 8  | Połączenie spawane                                                                | Ø D [mm] x s [mm]                                                                                                                                  | 48,3                  | x                    | 4,5                  | 48,3                          | x 4,5                                    |
| 9  | Połączenie kołnierzowe                                                            |                                                                                                                                                    | --                    |                      |                      | --                            |                                          |
| 10 | Zawór - dane projektowe                                                           |                                                                                                                                                    | Włot                  |                      |                      | Wylot                         |                                          |
| 11 | Wymiar nominalny                                                                  | DN / NPS                                                                                                                                           | 40                    |                      |                      | 40                            |                                          |
| 12 | Ciśnienie nominalne                                                               | PN / class                                                                                                                                         | 160                   |                      |                      | 160                           |                                          |
| 13 | Ciśnienie obliczeniowe                                                            | bar(g)                                                                                                                                             | 82                    |                      |                      | 82                            |                                          |
| 14 | Temperatura obliczeniowa                                                          | °C                                                                                                                                                 | 365                   |                      |                      | 365                           |                                          |
| 15 | Materiał                                                                          |                                                                                                                                                    | 1.5415 (16Mo3, 15Mo3) |                      |                      | 1.5415 (16Mo3, 15Mo3)         |                                          |
| 16 | Dane robocze                                                                      |                                                                                                                                                    | Przypadek obciążenia  | Przypadek obciążenia | Przypadek obciążenia | Przypadek obciążenia          | Przypadek obciążenia                     |
| 17 | Medium:                                                                           | woda/para                                                                                                                                          | 1                     | 2                    | 3                    | 4                             | 5                                        |
| 18 | Faza                                                                              |                                                                                                                                                    | para                  | para                 | para                 |                               | 6                                        |
| 19 | Przepływ                                                                          | kg/s                                                                                                                                               | 0,65                  | 0,86                 | 0,10                 |                               |                                          |
| 20 | Temperatura, wlot                                                                 | °C                                                                                                                                                 | 315,60                | 365,00               | 299,30               |                               |                                          |
| 21 | Ciśnienie, wlot                                                                   | barA                                                                                                                                               | 72,30                 | 83,00                | 48,60                |                               |                                          |
| 22 | Ciśnienie, wylot                                                                  | barA                                                                                                                                               | 53,10                 | 60,00                | 47,50                |                               |                                          |
| 23 | k <sub>v</sub>                                                                    | m³/h                                                                                                                                               | 3,41                  | 4,13                 | 2,48                 |                               |                                          |
| 24 | Prędkość przepływu, wylot                                                         | m/s                                                                                                                                                | 22,0                  | 29,3                 | 4,09                 |                               |                                          |
| 25 | Typ zaworu Zawór kulowy regulacyjny typ W                                         |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 26 | Parametry zaworu                                                                  |                                                                                                                                                    |                       |                      | Materiał             |                               |                                          |
| 27 | Wymiary gniazda:                                                                  | 25                                                                                                                                                 | mm                    | Korpus:              |                      |                               | 1.5415 (16Mo3, 15Mo3)                    |
| 28 | Etapy redukcji ciśnienie, regulowane:                                             | 1                                                                                                                                                  |                       | Pierścień gniazda:   |                      |                               | 1.4122 (X39CrMo17-1), uszczelka metalowa |
| 29 | Etapy redukcji ciśnienie, stałe:                                                  |                                                                                                                                                    |                       | Kula:                |                      |                               | 1.4122 (X39CrMo17-1), uszczelka metalowa |
| 30 | k <sub>vs</sub>                                                                   | 5                                                                                                                                                  | m³/h                  | Tarcza regulacyjna:  |                      |                               | 1.4122 (X39CrMo17-1), utwardzona         |
| 31 | Charakterystyka sterowania::                                                      | liniowa                                                                                                                                            |                       | Uszczelki:           |                      |                               | grafit                                   |
| 32 | maks. dp napędu:                                                                  | 82                                                                                                                                                 | bar                   |                      |                      |                               |                                          |
| 33 | Długość instalacji:                                                               | 200                                                                                                                                                | mm                    |                      |                      |                               |                                          |
| 34 |                                                                                   |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 35 | Projekt / Inspekcja                                                               |                                                                                                                                                    |                       |                      |                      | Potwierdzenie kontroli        |                                          |
| 36 | Dyrektywa Urządzeń Ciśnieniowych 2014/68/UE                                       |                                                                                                                                                    |                       |                      |                      | końcowej zgodnie z DIN EN 3.1 |                                          |
| 37 | Wymogi zgodnie z: EN 12952                                                        |                                                                                                                                                    |                       |                      |                      | 10204                         |                                          |
| 38 | Klasa wycieków: 0,01% of kvs-wartości                                             |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 39 |                                                                                   |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 40 | Napędu                                                                            | pneumatyczny                                                                                                                                       |                       |                      |                      |                               | 3170823                                  |
| 41 | typ:                                                                              | ProtACT PR134D; dwustronnego działania "rack&pinion"; awaria sygnału/powietrza: "Fail-in-Place"                                                    |                       |                      |                      |                               |                                          |
| 42 |                                                                                   | Pozycjoner Sipart PS2 6DR5120-ONG31-0AF0, połączeniem 2-przewodowe & HART-interface,                                                               |                       |                      |                      |                               |                                          |
| 43 |                                                                                   | ly-moduł (6DR4004-8J) do informacji zwrotnej o położeniu (4...20mA)                                                                                |                       |                      |                      |                               |                                          |
| 44 |                                                                                   | zestaw pneumatyczny P172CEACP G3/8", adapter G3/8"-G1/4", przewody rurowe ze stali nierdzewnej, 2 wyłączniki krańcowe ze skrzynkami połączeniowymi |                       |                      |                      |                               |                                          |
| 45 |                                                                                   | min. ciśnienie zasilające: 4,5 bar(g)                                                                                                              |                       |                      |                      |                               |                                          |
| 46 | Adaptacja Napędu:                                                                 | EN ISO 5211 - F10 - kwadrat 27 mm                                                                                                                  |                       |                      |                      |                               |                                          |
| 47 | Uwagi                                                                             |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 48 |                                                                                   |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 49 |                                                                                   |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 50 |                                                                                   |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 51 |                                                                                   |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 52 | Test wytrzymałości korpusu - test ciśnieniowy: p´= 172 bar - medium testowe: woda |                                                                                                                                                    |                       |                      |                      |                               |                                          |
| 53 | Rewizja                                                                           | 0                                                                                                                                                  | 1                     | 2                    | 3                    | 4                             | 5                                        |
| 54 | Data:                                                                             | 03.11.2021                                                                                                                                         | 27.12.2021            | 27.01.2022           | 22.04.2022           | 11.08.2022                    |                                          |
| 55 | Przygotowano:                                                                     | H. Roßmann                                                                                                                                         | P. Schüler            | D. Hermann           | P. Schüler           | P. Schüler                    |                                          |
| 56 | Sprawdzono:                                                                       | H. Jäkel                                                                                                                                           | R. Feldmann           | P. Schüler           | R. Feldmann          | M. Majewski                   |                                          |