

IN THE COURT OF COMMON PLEAS  
CUYAHOGA COUNTY, OHIO

ELDON DICKERSON & RUTH DICKERSON

Plaintiffs,

A-BEST PRODUCTS, et al.

Defendants.

CASE NO. 398302

JUDGE HARRY HANNA

PLAINTIFF'S EXHIBIT

IR-129

**DEFENDANT INGERSOLL RAND CORPORATION'S REVISED  
RESPONSES TO PLAINTIFF'S MASTER SET OF INTERROGATORIES  
AND REQUESTS FOR PRODUCTION PROPOUNDED TO  
VARIOUS DEFENDANTS IN THE ABOVE-CAPTIONED CASE**

Now comes Defendant Ingersoll Rand Corporation ("I-R"), by its undersigned attorneys, and hereby submits its responses and objections to Plaintiffs' Master Set of Interrogatories and Requests for Production. I-R provides these Responses as a separate document, but asserts that the Answers are a response to each Request and its subpart as provided by Plaintiffs.

**INTERROGATORIES**

1. John Clary. See also preliminary statement (a).  
Director, Product Liability  
Ingersoll-Rand Company  
200 Chestnut Ridge Road  
Woodcliff Lake, New Jersey 07675

Assistant Company Counsel (1976-1982), Business Manager (1982-1985),  
Assistant Company Counsel (1985-1987), General Manager (1987-1990), Director,  
Product Liability (1990-Present).

3. Ingersoll-Rand Company reincorporated in Bermuda on December 31, 2001 as Ingersoll-Rand Company Limited. Ingersoll-Rand Company was incorporated in New Jersey in 1905. Principal place of business is 200 Chestnut Ridge Road, Woodcliff Lake, NJ 07677. Note also, Ingersoll-Rand is a publicly traded company. See applicable filing(s) with the Securities and Exchange Commission.

- 4.1 Unknown.

5. Ingersoll-Rand submits that to the best of its knowledge none of its corporate predecessors, subsidiaries, affiliates, divisions, holding companies or other related entities have ever mined, milled, or manufactured "asbestos products" or "asbestos containing products" as it believes these terms are defined. For over one hundred and twenty-five years, Ingersoll-Rand has manufactured or marketed numerous multi-use equipment, including compressors and pumps, some of which are manufactured by third parties or contain parts manufactured by third parties. Some of the equipment or its replacement parts may have had an internal component, including gaskets, packing or brake system, manufactured by third parties that contained encapsulated asbestos fibers. Regarding

asbestos containing component parts that may have been incorporated into its equipment, Ingersoll-Rand purchased such component parts from various manufacturers based upon commercial availability and the particular application of the equipment being manufactured. Ingersoll-Rand does not maintain a list of the equipment which had an internal asbestos component part. The asbestos content, fiber type and composition of a component part would be only within the knowledge of the component's manufacturer and not this defendant.

The following supplemental answer is in addition to and not in derogation of the original answer provided by Ingersoll-Rand. Plaintiff's counsel has provided the counsel for Ingersoll-Rand with documents alleged to have been obtained from Queen City Steel. Those documents identify the sale of Ingersoll-Rand products to Queen City Steel and contain some identification of the products. Said documents appear to identify during the period of 1946-1952 nine Ingersoll-Rand pumps and one Ingersoll-Rand Type 30 air compressor. The pumps identified are motorpumps. The nine pumps identified are:

1. 2 RVN 5
2. RVNS 1
3. 1 ½ RVN 3
4. 3 RVL 7 ½
5. 1 ½ RVN 5
6. 4 RVL 10
7. 1 KRVS 1
8. 1 RVN 1 ½
9. 1 ½ KRVS 2

Regarding the nine above listed motor pumps, Ingersoll-Rand is presently unable to identify the type of gasket or packing seal utilized but will supplement this answer if that information becomes available. Note, that said documents contain notations that some of the pumps were used to handle clear water, or liquid water service or water at room temperature. As a result, the gaskets or packing on those pumps may have utilized an encapsulated non-asbestos fiber such as cotton or vegetable. The records also do not indicate whether mechanical seals were utilized in place of a stuffing box, which would eliminate the need for seal packing.

Regarding the Type 30 air compressor, in approximately 1972, a flood at the Ingersoll-Rand facility containing the documents relevant to this compressor destroyed those documents. Accordingly, Ingersoll-Rand is unable to identify the type of gaskets utilized in the compressor but will supplement this answer if that information becomes available.

7. Unknown. Ingersoll-Rand did not manufacture the asbestos containing component parts that may have been incorporated into its equipment. Ingersoll-Rand

purchased such component parts from various manufacturers based upon commercial availability and the particular application of the equipment being manufactured. The asbestos content, fiber type and composition of a component part would be only within the knowledge of the component's manufacturer and not this defendant.

8. Unknown. Ingersoll-Rand did not manufacture the asbestos containing component parts that may have been incorporated into its equipment. Ingersoll-Rand purchased such component parts from various manufacturers based upon commercial availability and the particular application of the equipment being manufactured.

8.02 See Response to Interrogatory No. 5. Regarding the internal encapsulated asbestos containing component parts that may have been incorporated into its equipment, Ingersoll-Rand purchased such component parts from various manufacturers based upon commercial availability and the particular application of the equipment being manufactured. Upon information and belief, some of the component part manufacturers included Garlock, Flexitallic, Crane and Anchor Packing.

8.03 No.

8.04 Not applicable.

8.05 No as to the manufacture, distribution, and/or marketing. Unknown as to purchase and/or use. See Response to Interrogatory No. 5. Our best estimate is that internal encapsulated asbestos containing component parts were removed when new government standards were promulgated for encapsulated gaskets and packing, and when alternative non-asbestos component products became commercially available from the component manufacturers.

8.06 See Response to Interrogatory No. 5. Regarding the internal encapsulated asbestos containing component parts that may have been incorporated into its equipment, Ingersoll-Rand purchased such component parts from various manufacturers based upon commercial availability and the particular application of the equipment being manufactured. Upon information and belief, some of the component part manufacturers included Garlock, Flexitallic, Crane and Anchor Packing.

8.1 The following supplemental answer is in addition to and not in derogation of the original answer provided by Ingersoll-Rand. Plaintiff's counsel has provided the counsel for Ingersoll-Rand with documents alleged to have been obtained from Queen City Steel. Those documents identify the sale of Ingersoll-Rand products to Queen City Steel and contain some identification of the products. Said documents appear to identify during the period of 1946-1952 nine Ingersoll-Rand pumps and one Ingersoll-Rand Type 30 air compressor. The pumps identified are motorpumps. The nine pumps identified are:

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Regarding the Type 30 air compressor, in approximately 1972, a flood at the Ingersoll-Rand facility containing the documents relevant to this compressor destroyed those documents. Accordingly, Ingersoll-Rand is unable to identify the type of gaskets utilized in the compressor but will supplement this answer if that information becomes available.

8.2 Unknown. See Response to Interrogatory No. 8.1.

8.3 Unknown.

8.4 See Response to Interrogatory No. 8.1.

9. Subject to the Response to Interrogatory No. 8.1, unknown.

9.1 None.

12. Ingersoll-Rand did not manufacture or assemble the internal encapsulated asbestos containing component parts that may have been incorporated into its equipment.

13. No.

14. Unknown, Ingersoll-Rand did not manufacture or design the internal encapsulated asbestos containing component parts that may have been incorporated into its equipment. The asbestos content, fiber type and composition of a component part would be only within the knowledge of the component's manufacturer and not this defendant.

17. Unknown, Ingersoll-Rand did not manufacture or design the internal encapsulated asbestos containing component parts that may have been incorporated into its equipment. The asbestos content, fiber type and composition of a component part would be only within the knowledge of the component's manufacturer and not this defendant.

18. No tests concerning potential health hazards were conducted as to asbestos containing products. Ingersoll-Rand objects to this interrogatory as argumentative to the extent that it implies that it was under a duty to provide warnings for its products, or that any products sold by it would expose workers to harmful dust levels.

18.1 No tests concerning potential health hazards were conducted as to asbestos containing products. Ingersoll-Rand objects to this interrogatory as argumentative to the extent that it implies that it was under a duty to provide warnings for its products, or that any products sold by it would expose workers to harmful dust levels.

19. See Response to Interrogatory No. 18.

20. Not applicable.

21. No tests concerning potential health hazards were conducted as to asbestos containing products. Ingersoll-Rand objects to this interrogatory as argumentative to the extent that it implies that it was under a duty to provide warnings for its products, or that any products sold by it would expose workers to harmful dust levels.

23. No tests concerning potential health hazards were conducted as to asbestos containing products. Ingersoll-Rand objects to this interrogatory as argumentative to the extent that it implies that it was under a duty to provide warnings for its products, or that any products sold by it would expose workers to harmful dust levels.

41. No as to possible health effects of asbestos. Ingersoll-Rand objects to this interrogatory as argumentative to the extent that it implies that it was under a duty to provide warnings for its products, or that any products sold by it would expose workers to harmful dust levels.

42. No.

43. Ingersoll-Rand equipment would likely have included an instructions manual.

44. Unknown. Ingersoll-Rand equipment would likely have included an instructions manual.

46. No as to possible health effects of asbestos. Ingersoll-Rand objects to this interrogatory as argumentative to the extent that it implies that it was under a duty to provide warnings for its products, or that any products sold by it would expose workers to harmful dust levels.

48.1 None, Ingersoll-Rand has a seven year documents retention policy for sales records.

48.3 No.

48.4 No.

52. Ingersoll-Rand does not consider itself competent to offer opinions as to respirators, masks or other breathing devices, and will rely upon its expert(s). However, Ingersoll-Rand is aware that differences in the composition of the products play a large role in the friability and consequent respirability of asbestos fibers contained within such products. Where fibers are encapsulated, fiber emission is negligible, if any.

55.1 Ingersoll-Rand has not completed its investigation of the facts and circumstances which are the basis of this litigation and is unable to answer this Interrogatory at the present time. Ingersoll-Rand will supplement its answers pursuant to the Ohio Civil Rules.

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57. Ingersoll-Rand has not completed its investigation of the facts and circumstances which are the basis of this litigation and is unable to answer this Interrogatory at the present time. Ingersoll-Rand will supplement its answers pursuant to the Ohio Civil Rules.

58. The last date an internal encapsulated asbestos containing component part was utilized in Ingersoll-Rand's equipment is unknown. Our best estimate is that internal encapsulated asbestos containing component parts were no longer utilized when new government standards were promulgated for encapsulated gaskets and packing, and when viable alternative non-asbestos component parts became commercially available from the component manufacturers.

#### **REQUESTS FOR PRODUCTION:**

1. Defendant Ingersoll-Rand objects to Request for Production No. 1 as same is vague, overly broad and general. For over 125 years, Ingersoll-Rand has manufactured or marketed multi-use equipment, including compressors and pumps, some of which are manufactured by third parties or contain parts manufactured by third parties. Some of the equipment or its replacement parts may have had an internal component, including gaskets or packing, manufactured by third parties that contained encapsulated asbestos fibers. Regarding gaskets or packing, Ingersoll-Rand purchased such component parts from various manufacturers based upon commercial availability and the particular

application of the equipment being manufactured. Ingersoll-Rand does not maintain a list of the equipment which had an internal asbestos component part. The asbestos content, fiber type and composition of any gasket or packing component part would be only within the knowledge of the component's manufacturer and not this defendant. Without waiving such objection, Ingersoll-Rand Product Brochures of its equipment are available for inspection at the law firm of Gallagher, Sharp, Fulton & Norman, 7<sup>th</sup> Floor, Bulkley Building, 1501 Euclid Avenue, Cleveland, OH 44115-2108. By providing these Product Brochures for review and inspection, Defendant in now way represents that these specific brochures involve equipment that definitively incorporated asbestos-containing gaskets or packing.

The following supplemental answer is in addition to and not in derogation of the original answer provided by Ingersoll-Rand. Plaintiff's counsel has provided the counsel for Ingersoll-Rand with documents alleged to have been obtained from Queen City Steel. Those documents identify the sale of Ingersoll-Rand products to Queen City Steel and contain some identification of the products. Said documents appear to identify during the period of 1946-1952 nine Ingersoll-Rand pumps and one Ingersoll-Rand Type 30 air compressor. The pumps identified are motorpumps. The nine pumps identified are:

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Regarding the nine above listed motor pumps, Ingersoll-Rand is presently unable to identify the type of gasket or packing seal utilized but will supplement this answer if that information becomes available. Note, that said documents contain notations that some of the pumps were used to handle clear water, or liquid water service or water at room temperature. As a result, the gaskets or packing on those pumps may have utilized an encapsulated non-asbestos fiber such as cotton or vegetable. The records also do not indicate whether mechanical seals were utilized in place of a stuffing box, which would eliminate the need for seal packing. Attached as **Exhibit A**, a brochure of Type RV Motorpump. Attached as **Exhibit B**, a brochure of a Type KRVS Motorpump.

Regarding the Type 30 air compressor, in approximately 1972, a flood at the Ingersoll-Rand facility containing the documents relevant to this compressor destroyed those documents. Accordingly, Ingersoll-Rand is unable to identify the type of gaskets utilized in the compressor but will supplement this answer if that information becomes

available. Attached as **Exhibit C**, is a brochure of a Type 30 Reciprocating Air Compressor.

2. Ingersoll Rand is in possession of the documents, which Plaintiff Counsel presented to Ingersoll Rand's Counsel in Cleveland, Ohio, said documents apparently representing information which Plaintiff Counsel obtained from Queen City Steel. These documents identify the sale of Ingersoll-Rand products to Queen City Steel and contain some identification of the products. Said documents appear to identify during the period of 1946-1952 nine Ingersoll-Rand pumps and one Ingersoll-Rand Type 30 air compressor. The pumps identified are motorpumps. The nine pumps identified are RVN 5, RVNS 1, 1 ½ RVN 3, 3 RVL 7 ½, 1 ½ RVN 5, 4 RVL 10, 1 KRVS 1, 1 RVN 1 ½, and 1 ½ KRVS 2. Since Plaintiff Counsel supplied these documents to Ingersoll-Rand's Cleveland, Ohio Counsel, and as such is obviously in possession of duplicate copies, Ingersoll Rand sees no need to provide the same information which Plaintiff Counsel already has. Additionally, Ingersoll Rand in no way represents that the referenced equipment in these documents incorporated an internal encapsulated asbestos-containing component part.

3. None.

6. None.

7. None.

8. None.

9. None.

10. None.

11. None.

12. None.

13. None.

14. None.

15. None.

16. Defendant Ingersoll-Rand objects to Request for Production No. 1 as same is vague, overly broad and general. For over 125 years, Ingersoll-Rand has manufactured or marketed multi-use equipment, including compressors and pumps, some of which are manufactured by third parties or contain parts manufactured by third parties. Some of the equipment or its replacement parts may have had an internal component, including gaskets or packing, manufactured by third parties that contained encapsulated asbestos fibers. Regarding gaskets or packing, Ingersoll-Rand purchased such component parts from various manufacturers based upon commercial availability and the particular application of the equipment being manufactured. Ingersoll-Rand does not maintain a list of the equipment which had an internal asbestos component part. The asbestos content, fiber type and composition of any gasket or packing component part would be only within the knowledge of the component's manufacturer and not this defendant. Without waiving such objection, Ingersoll-Rand Product Brochures of its equipment are available for inspection at the law firm of Gallagher, Sharp, Fulton & Norman, 7<sup>th</sup> Floor, Bulkley Building, 1501 Euclid Avenue, Cleveland, OH 44115-2108. By providing these Product Brochures for review and inspection, Defendant in now way represents that these specific brochures involve equipment that definitively incorporated asbestos-containing gaskets or packing.

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17. None.

18. See Response to Request No. 16.

21. None.

26. None.

27. To be supplied. Ingersoll-Rand notes it is a publicly traded company its applicable financial records are filed with the Securities and Exchange Commission.

28. Ingersoll-Rand has not completed its investigation of the facts and circumstances which are the basis of this litigation and is unable to answer this Request at the present time. Ingersoll-Rand will supplement its answers pursuant to the Ohio Civil Rules.

29. Ingersoll-Rand has not completed its investigation of the facts and circumstances which are the basis of this litigation and is unable to answer this Request at the present time. Ingersoll-Rand will supplement its answers pursuant to the Ohio Civil Rules.

35. None.

36. None known as to asbestos.

37. None known as to asbestos.

38. None known as to asbestos.

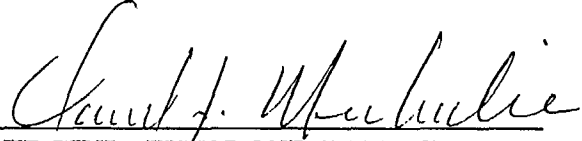
41. None.

51. Unknown

52. The information supplied in these Responses is not based solely upon the knowledge of the executing party, but includes some information assembled by and/or within the knowledge of the party's authorized agents, representatives, and, unless privileged, attorneys. Because much of the information is of, or relates to, events of many years ago, it is difficult, if not impossible, for this Defendant to retrieve or reconstruct some of the requested information. Many of the individuals who might have had personal knowledge of the matters to which Plaintiffs' discovery relate are deceased or are otherwise unavailable to Defendant, and investigations to date indicate that some information in documents which might relate to matters inquired into by Plaintiffs' discovery may have been destroyed pursuant to Defendant's normal record retention policy or are otherwise unable to find. This Defendant is engaged in a continuing investigation in an attempt to locate or confirm the absence of such information or documents and this Defendant is also engaged in a continuing investigation with respect to the matters inquired into by Plaintiffs' discovery. Therefore, this Defendant reserves the right to amend these responses if new or more accurate information becomes available or if errors are discovered. Furthermore, these responses are given without prejudice to this Defendant's right to rely at trial on subsequently discovered information or on information inadvertently omitted from these responses as a result of mistake, error or oversight.

Respectfully submitted,

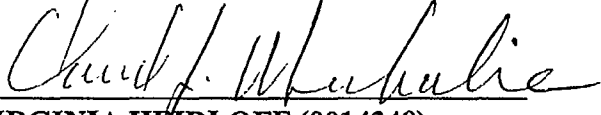
Of Counsel:  
GALLAGHER, SHARP, FULTON  
FULTON & NORMAN

  
VIRGINIA HEIDLOFF (0014348)  
DANIEL J. MICHALEC (0042733)  
Attorneys for Defendant Ingersoll Rand  
Corporation  
Seventh Floor-Bulkley Building  
1501 Euclid Avenue  
Cleveland, Ohio 44115  
Telephone: (216) 241-5310  
Facsimile: (216) 241-1608

**CERTIFICATE OF SERVICE**

Hard copy of the foregoing have been served upon Plaintiff's Counsel, Ladd Gibke, Esq., BARON & BUDD P.C., 3102 Oak Lawn Avenue, Suite 1100, Dallas, Texas 75219, via Federal Express this 19<sup>th</sup> day of April, 2002, with a Notice of Service filed electronically via CLAD on this 19<sup>th</sup> day of April, 2002, such electronic filing constituting notice to all Counsel of Record.

Of Counsel:  
GALLAGHER, SHARP, FULTON  
FULTON & NORMAN

  
VIRGINIA HEIDLOFF (0014348)  
DANIEL J. MICHALEC (0042733)  
Attorneys for Defendant Ingersoll Rand  
Corporation  
Seventh Floor-Bulkley Building  
1501 Euclid Avenue  
Cleveland, Ohio 44115  
Telephone: (216) 241-5310  
Facsimile: (216) 241-1608

# Type RV General Purpose Motorpump

Single stage end suction overhung impeller general purpose pump close coupled to a motor driver. Designed for continuous service handling hot and cold liquids.

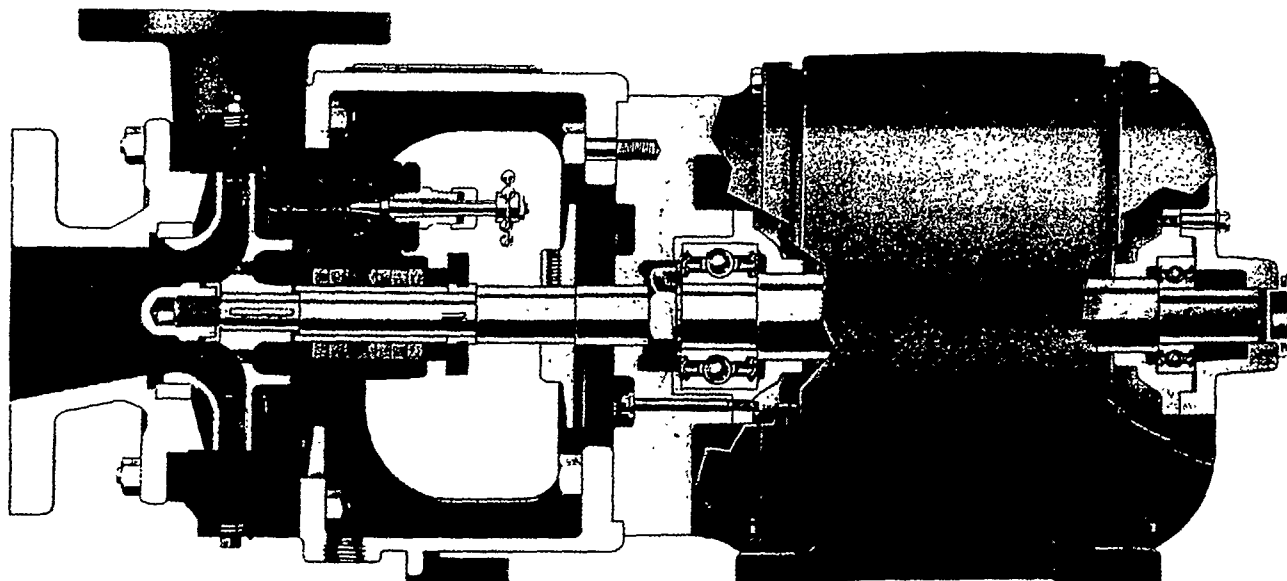
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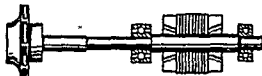
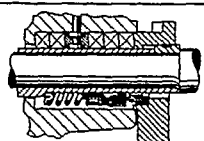
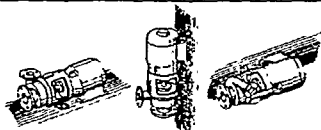
Sheet 481

Feb., 1967

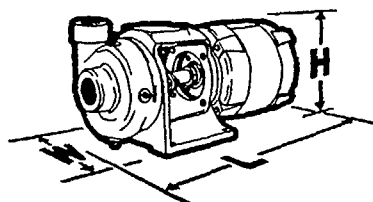
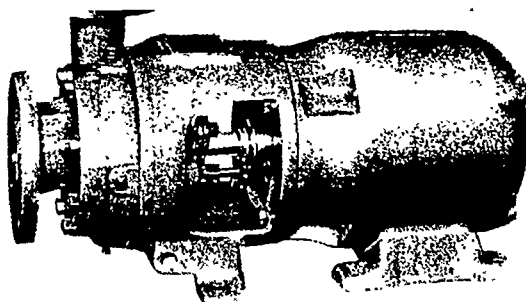
FIRST EDITION

Dem. &amp; Exp. on 166.



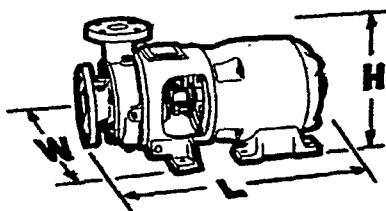
| PUMP FEATURES                            |                                                                                     |                                                                          | CUSTOMER BENEFITS                                                         |
|------------------------------------------|-------------------------------------------------------------------------------------|--------------------------------------------------------------------------|---------------------------------------------------------------------------|
| HEAVY-DUTY<br>CLOSE<br>COUPLED<br>DESIGN |  | Compact<br>No alignment<br>Only one stuffing box                         | Low initial cost<br>Low installation cost<br>Fewer parts—less maintenance |
| PACKED BOX<br>OR<br>MECHANICAL<br>SEAL   |  | Five packing rings and sealing gland<br>Single or double mechanical seal | Correct sealing arrangement to<br>match the application                   |
| ★ REPLACEABLE<br>WEARING PARTS           |  | Wearing rings<br>Shaft sleeves                                           | Wearing parts can be replaced at low cost                                 |
| ★ KEYED IMPELLER HELD WITH SHAFT NUT     |                                                                                     |                                                                          | Impeller cannot back off with reverse rotation                            |
| ★ SHAFT SLEEVE SEALED WITH "O" RING      |                                                                                     |                                                                          | No leakage under shaft sleeve                                             |
| PRE-LUBRICATED<br>BEARINGS               |  | Sealed, grease lubricated type                                           | No routine lubrication                                                    |
| VERSATILITY<br>OF<br>MOUNTING            |  | Horizontal, vertical or side-wall<br>Four standard discharge positions   | Adaptable to a variety of<br>piping arrangements                          |
| STOCK SHIPMENT                           |                                                                                     |                                                                          | Quick availability                                                        |

★ I-R Exclusive or outstanding  
advantage



| Pump Size and Type | Speed RPM | Approximate Shipping Wt., lbs. |          | Section Dia. | Approximate Dimensions |        |        |
|--------------------|-----------|--------------------------------|----------|--------------|------------------------|--------|--------|
|                    |           | DP                             | TE or XP |              | L                      | W      | H      |
| 1RVN1              | 1750      | 145                            | 175      | 1 1/2        | 19 3/4                 | 8      | 9      |
| 1RVN1 1/2          | 3450      | 145                            | 175      | 1 1/2        | 19 3/4                 | 8      | 9      |
| 1RVN2              | 3450      | 165                            | 205      | 1 1/2        | 20 1/2                 | 8      | 9      |
| 1RVN3              | 3450      | 180                            | 205      | 1 1/2        | 20 1/2                 | 8      | 9      |
| 1RVNL2E            | 3450      | 175                            | 200      | 2            | 22 1/2                 | 8      | 9      |
| 1RVNL3E            | 3450      | 190                            | 215      | 2            | 22 1/2                 | 8      | 9      |
| 1RVNL2D            | 3450      | 185                            | 210      | 2            | 22 1/2                 | 8      | 9      |
| 1RVNL3D            | 3450      | 200                            | 225      | 2            | 22 1/2                 | 8      | 9      |
| 1RVNL5D            | 3450      | 235                            | 280      | 2            | 24 1/2                 | 10 1/4 | 10 1/2 |
| 1 1/2 RVN1         | 1750      | 155                            | 185      | 2            | 20 3/4                 | 8      | 9 3/4  |
| 1 1/2 RVN2         | 3450      | 175                            | 200      | 2            | 21 3/4                 | 8      | 9 3/4  |
| 1 1/2 RVN3         | 3450      | 190                            | 215      | 2            | 21 3/4                 | 8      | 9 3/4  |
| 1 1/2 RVN5         | 3450      | 225                            | 270      | 2            | 23 1/2                 | 10 1/2 | 10 3/4 |
| 1 1/2 RVN7 1/2     | 3450      | 245                            | 300      | 2            | 25                     | 10 1/2 | 10 3/4 |

| Pump Size and Type | Speed RPM | Approximate Shipping Wt., lbs. |          | Section Dia. | Approximate Dimensions |        |        |
|--------------------|-----------|--------------------------------|----------|--------------|------------------------|--------|--------|
|                    |           | DP                             | TE or XP |              | L                      | W      | H      |
| 1 1/2 RVNL1        | 1750      | 175                            | 205      | 2            | 21 1/2                 | 8      | 9      |
| 1 1/2 RVNL1 1/2    | 1750      | 195                            | 220      | 2            | 22 1/2                 | 8      | 9      |
| 1 1/2 RVNL5        | 3450      | 245                            | 290      | 2            | 24 1/2                 | 10 1/4 | 10 1/2 |
| 1 1/2 RVNL7 1/2    | 3450      | 265                            | 320      | 2            | 25 1/2                 | 10 1/4 | 10 1/2 |
| 1 1/2 RVNL10       | 3450      | 335                            | 390      | 2            | 28 1/2                 | 10 1/4 | 12 1/2 |
| 2RVN1              | 1750      | 165                            | 195      | 3            | 21 1/2                 | 8      | 9      |
| 2RVN7 1/2          | 3450      | 255                            | 310      | 3            | 25 3/4                 | 9 1/4  | 10 1/2 |
| 2RVNL1 1/2         | 1750      | 205                            | 230      | 2 1/2        | 22 1/2                 | 8      | 9      |
| 2RVNL7 1/2         | 3450      | 275                            | 330      | 2 1/2        | 25 3/4                 | 10 1/4 | 10 1/2 |
| 2RVNL10            | 3450      | 345                            | 400      | 2 1/2        | 28 1/2                 | 10 1/4 | 12 1/2 |
| 2RVNL15            | 3450      | 370                            | 425      | 3 1/2        | 30                     | 10 1/4 | 12 1/2 |
| 3RVNL10            | 3450      | 355                            | 410      | 4            | 28 1/2                 | 10 1/4 | 12 1/2 |
| 3RVNL15            | 3450      | 380                            | 435      | 4            | 30                     | 10 1/4 | 12 1/2 |
| 3RVNL20            | 3450      | 465                            | 565      | 4            | 30 1/2                 | 13     | 14 1/2 |
| 3RVNL25            | 3450      | 485                            | 725      | 4            | 34                     | 14     | 14 1/2 |



| Pump Size and Type | Speed RPM | Approximate Shipping Wt., lbs. |          | Section Dia. | Approximate Dimensions |        |        |
|--------------------|-----------|--------------------------------|----------|--------------|------------------------|--------|--------|
|                    |           | DP                             | TE or XP |              | L                      | W      | H      |
| 1 1/2 RVH5         | 3450      | 270                            | 315      | 2 1/2        | 27                     | 12 3/4 | 11 3/4 |
| 1 1/2 RVH7 1/2     | 3450      | 290                            | 345      | 2 1/2        | 27                     | 12 3/4 | 11 3/4 |
| 1 1/2 RVH10        | 3450      | 360                            | 415      | 2 1/2        | 30 1/2                 | 12 3/4 | 12 3/4 |
| 1 1/2 RVH15        | 3450      | 385                            | 440      | 2 1/2        | 30 1/2                 | 12 3/4 | 12 3/4 |
| 2RVH15             | 3450      | 400                            | 455      | 3            | 30 1/2                 | 13 3/4 | 14     |
| 2RVH20             | 3450      | 485                            | 585      | 3            | 32 1/2                 | 13 3/4 | 14 3/4 |
| 2RVH25             | 3450      | 505                            | 745      | 3            | 32 1/2                 | 13 3/4 | 14 3/4 |
| 3RVS1              | 1750      | 200                            | 230      | 4            | 25 1/2                 | 13     | 13     |
| 3RVS1 1/2          | 1750      | 220                            | 245      | 4            | 25 1/2                 | 13     | 13     |
| 3RVS2              | 1750      | 260                            | 260      | 4            | 25 1/2                 | 13     | 13     |
| 3RVS3              | 3450      | 235                            | 260      | 4            | 25 1/2                 | 13     | 13     |
| 3RVS5              | 3450      | 270                            | 315      | 4            | 28                     | 13     | 11 3/4 |
| 3RVS7 1/2          | 3450      | 290                            | 345      | 4            | 31 1/2                 | 13     | 13 1/2 |
| 3RVS10             | 3450      | 360                            | 415      | 4            | 31 1/2                 | 13     | 13 1/2 |
| 3RVS15             | 3450      | 415                            | 470      | 4            | 34 1/2                 | 13     | 13 1/2 |
| 3RVH15             | 3450      | 550                            | 790      | 4            | 36                     | 15 3/4 | 15     |
| 3RVH25             | 3450      | 685                            | 830      | 4            | 36                     | 16 3/4 | 16     |
| 3RVH30             | 3450      | 730                            | 1250     | 4            | 36                     | 16 3/4 | 16     |
| 4RVL5              | 1150      | 470                            | 525      | 5            | 34 1/2                 | 19 1/4 | 16 1/2 |
| 4RVL7 1/2          | 1150      | 495                            | 550      | 5            | 34 1/2                 | 19 1/4 | 16 1/2 |
| 4RVL10             | 1150      | 560                            | 680      | 5            | 34 1/2                 | 19 1/4 | 17     |
| 4RVL15             | 1750      | 495                            | 550      | 5            | 34 1/2                 | 19 1/4 | 16 1/2 |
| 4RVL20             | 1750      | 560                            | 680      | 5            | 34 1/2                 | 19 1/4 | 17     |
| 4RVL25             | 1750      | 625                            | 840      | 5            | 36 1/2                 | 19 1/4 | 17     |
| 4RVL30             | 1750      | 735                            | 880      | 5            | 36 1/2                 | 19 1/4 | 18     |
| 4RVL30             | 1750      | 775                            | 920      | 5            | 36 1/2                 | 19 1/4 | 18     |

| Pump Size and Type | Speed RPM | Approximate Shipping Wt., lbs. |          | Section Dia. | Approximate Dimensions |        |        |
|--------------------|-----------|--------------------------------|----------|--------------|------------------------|--------|--------|
|                    |           | DP                             | TE or XP |              | L                      | W      | H      |
| 5RVL5              | 1150      | 495                            | 550      | 6            | 35                     | 21 3/4 | 14 1/2 |
| 5RVL7 1/2          | 1150      | 520                            | 575      | 6            | 35                     | 21 3/4 | 14 1/2 |
| 5RVL10             | 1150      | 585                            | 705      | 6            | 35                     | 21 3/4 | 15 1/4 |
| 5RVL15             | 1150      | 650                            | 865      | 6            | 37                     | 21 3/4 | 16 1/4 |
| 5RVL15             | 1750      | 585                            | 705      | 6            | 35                     | 21 3/4 | 15 1/4 |
| 5RVL20             | 1150      | 760                            | 905      | 6            | 37                     | 21 3/4 | 16 1/4 |
| 5RVL20             | 1750      | 650                            | 865      | 6            | 37                     | 21 3/4 | 15 1/4 |
| 5RVL25             | 1750      | 760                            | 905      | 6            | 37                     | 21 3/4 | 16 1/4 |
| 5RVL30             | 1750      | 800                            | 945      | 6            | 37                     | 21 3/4 | 16 1/4 |
| 5RVL40             | 1750      | 1050                           | 1335     | 6            | 38 1/2                 | 21 3/4 | 17 1/2 |
| 5RVL50             | 1750      | 1200                           | 1550     | 6            | 38 1/2                 | 21 3/4 | 17 1/2 |
| 5RVL60             | 1750      | 1350                           | 1775     | 6            | 39 3/4                 | 21 3/4 | 18 1/4 |
| 5RVH30             | 1750      | 975                            | 1125     | 6            | 40 1/4                 | 25 1/2 | 21     |
| 5RVH40             | 1750      | 1225                           | 1525     | 6            | 41 3/4                 | 25 1/2 | 22     |
| 5RVH50             | 1750      | 1375                           | 1725     | 6            | 41 3/4                 | 25 1/2 | 22     |
| 5RVH60             | 1750      | 1475                           | 1850     | 6            | 44 3/4                 | 25 1/2 | 23     |
| 5RVH75             | 1750      | 1600                           | 2250     | 6            | 44 3/4                 | 25 1/2 | 23     |
| 5RVH100            | 1750      | 2350                           | 2350     | 6            | 53 1/2                 | 25 1/2 | 24     |
| 6RVL15             | 1150      | 950                            | 1175     | 8            | 42 1/2                 | 26     | 22     |
| 6RVL20             | 1150      | 1050                           | 1200     | 8            | 42 1/2                 | 26     | 22     |
| 6RVL40             | 1750      | 1350                           | 1650     | 8            | 44                     | 26     | 23     |
| 6RVL50             | 1750      | 1500                           | 1850     | 8            | 44                     | 26     | 23     |
| 6RVL60             | 1750      | 1600                           | 1975     | 8            | 51 1/2                 | 26     | 24     |
| 6RVL75             | 1750      | 1725                           | 2375     | 8            | 51 1/2                 | 26     | 24     |
| 6RVL100            | 1750      | 1850                           | 2475     | 8            | 54 1/2                 | 26     | 25     |



**Ingersoll-Rand**

Cameron Pump Division  
11 Broadway  
New York, N. Y. 10004

## Type KRVS Motorpump

Single stage end suction overhung impeller general purpose pump close coupled to a motor driver. Designed for continuous service handling hot and cold liquids.

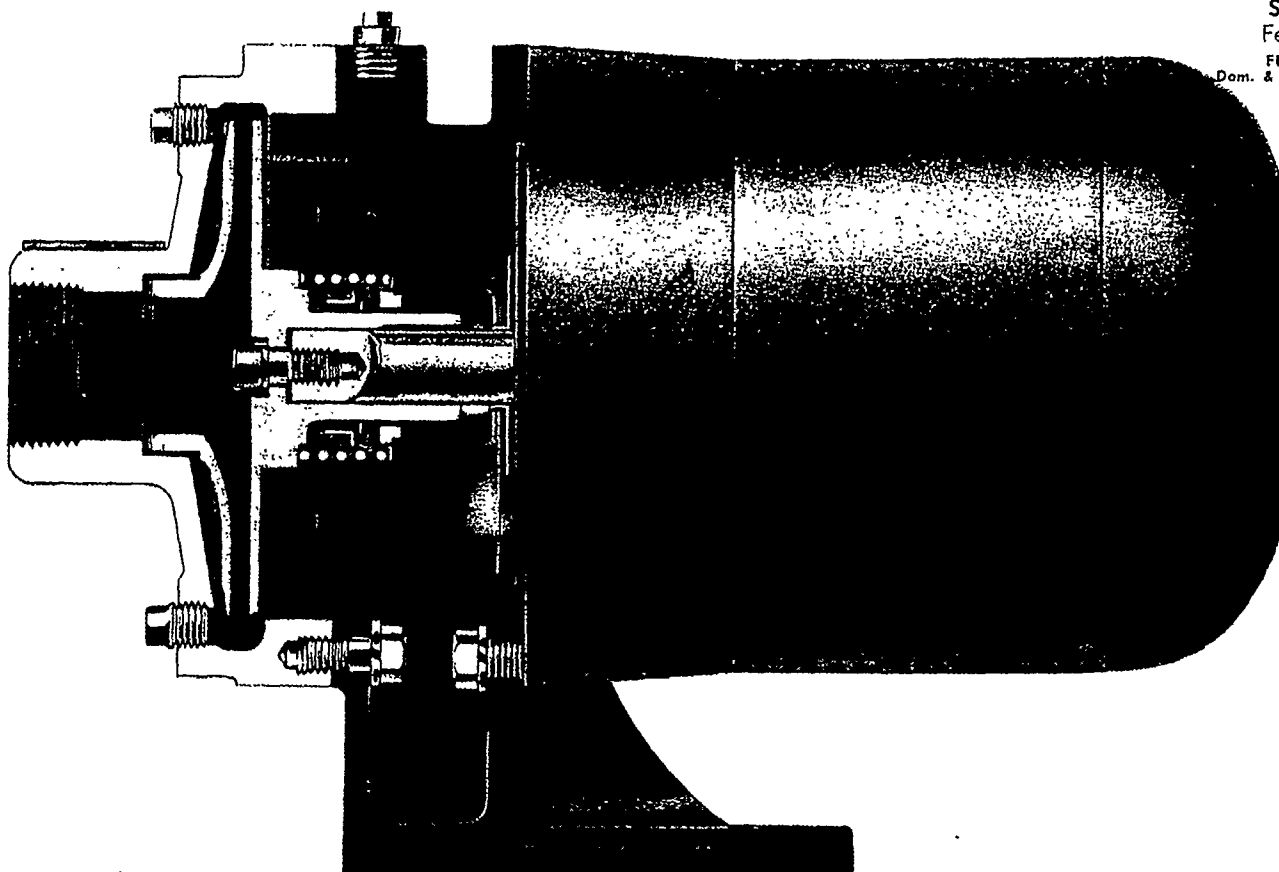
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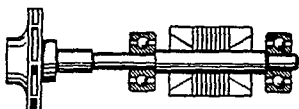
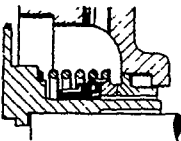
Sheet 481

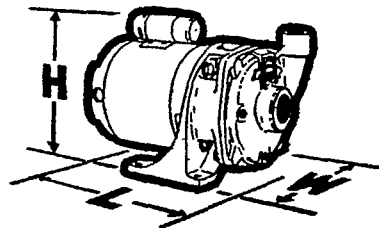
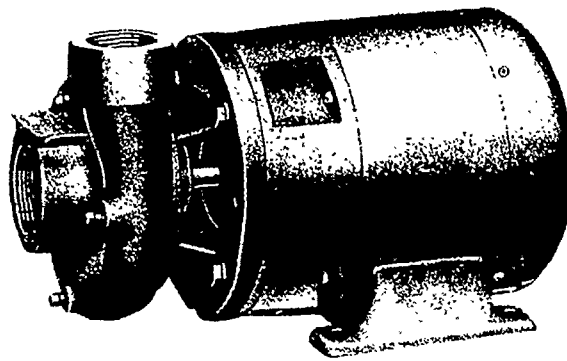
Feb., 1967

FIRST EDITION

Dom. & Exp. on 166



| PUMP FEATURES                                                                                                         |                                                                        | CUSTOMER BENEFITS                                                         |
|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|---------------------------------------------------------------------------|
| <b>CLOSE-COUPLED DESIGN</b><br>    | Compact<br>No alignment<br>Only one stuffing box                       | Low initial cost<br>Low installation cost<br>Fewer parts—less maintenance |
| <b>BUILT-IN SEAL</b><br>           | Spring-loaded, self adjusting                                          | No stuffing box maintenance                                               |
| <b>PRE-LUBRICATED BEARINGS</b><br> | Sealed, grease lubricated type                                         | No routine lubrication                                                    |
| <b>VERSATILITY OF MOUNTING</b><br> | Horizontal, vertical or side-wall<br>Four standard discharge positions | Adaptable to a variety of piping arrangements                             |
| <b>OFF-THE-SHELF SHIPMENT</b>                                                                                         |                                                                        | Immediate availability                                                    |

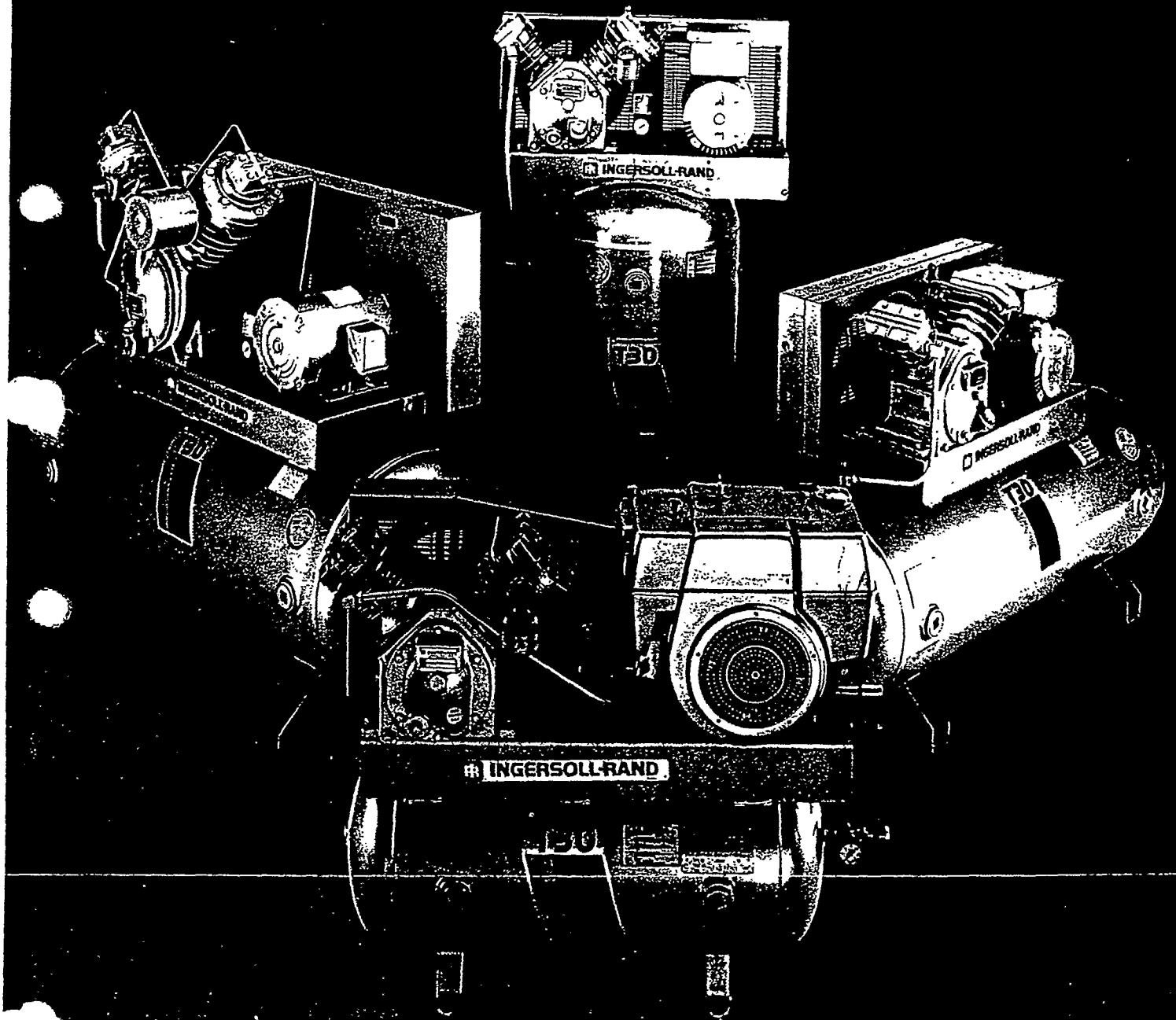


| Pump Size and Type | Speed RPM | Approximate Shipping Wt., lbs. |          | Section Dia. | Approximate Dimensions |        |       |
|--------------------|-----------|--------------------------------|----------|--------------|------------------------|--------|-------|
|                    |           | DP                             | TE or XP |              | L                      | W      | H     |
| 3/4 KRVS A 1/4     | 1750      | 45                             | 45       | 1 1/4        | 16 1/2                 | 8      | 8     |
| 3/4 KRVS A 1/2     | 3450      | 50                             | 50       | 1 1/4        | 18 1/2                 | 8      | 8     |
| 3/4 KRVS A 3/4     | 3450      | 55                             | 55       | 1 1/4        | 16 1/2                 | 8      | 8     |
| 3/4 KRVS A 1       | 3450      | 60                             | 60       | 1 1/4        | 16 1/2                 | 8      | 8     |
| 3/4 KRVS A 1 1/2   | 3450      | 70                             | 70       | 1 1/4        | 16 1/2                 | 8      | 8     |
| 1 KRVS 1 1/2       | 3450      | 130                            | 95       | 1 1/2        | 16 1/2                 | 8      | 8     |
| 1 KRVS 2           | 3450      | 135                            | 140      | 1 1/2        | 18 3/4                 | 8 3/4  | 9 1/2 |
| 1 KRVS 3           | 3450      | 140                            | 150      | 1 1/2        | 18 3/4                 | 8 3/4  | 9 1/2 |
| 1 KRVS 5           | 3450      | 175                            | 215      | 1 1/2        | 23                     | 10 1/2 | 11    |
| 1 1/4 KRVS A 1/4   | 1750      | 55                             | 55       | 1 1/2        | 18 1/4                 | 10     | 10    |
| 1 1/4 KRVS A 1/2   | 1750      | 60                             | 60       | 1 1/2        | 18 1/4                 | 10     | 10    |
| 1 1/4 KRVS A 3/4   | 3450      | 65                             | 65       | 1 1/2        | 18 1/4                 | 10     | 10    |
| 1 1/4 KRVS A 1     | 3450      | 70                             | 70       | 1 1/2        | 18 1/4                 | 10     | 10    |
| 1 1/4 KRVS A 1 1/2 | 3450      | 80                             | 80       | 1 1/2        | 18 1/4                 | 10     | 10    |
| 1 1/4 KRVS A 2     | 3450      | 110                            | 115      | 1 1/2        | 18 1/4                 | 10     | 10    |
| 1 1/4 KRVS A 3     | 3450      | 115                            | 120      | 1 1/2        | 18 1/4                 | 10     | 10    |
| 1 1/2 KRVS 1/4     | 1750      | 70                             | 65       | 2            | 19                     | 8 1/2  | 8 1/2 |
| 1 1/2 KRVS 1/2     | 1750      | 80                             | 70       | 2            | 19                     | 8 1/2  | 8 1/2 |
| 1 1/2 KRVS 3/4     | 3450      | 80                             | 80       | 2            | 19                     | 8 1/2  | 8 1/2 |
| 1 1/2 KRVS 1       | 1750      | 80                             | 80       | 2            | 19                     | 8 1/2  | 8 1/2 |
| 1 1/2 KRVS 1 1/2   | 3450      | 85                             | 85       | 2            | 19                     | 8 1/2  | 8 1/2 |

| Pump Size and Type | Speed RPM | Approximate Shipping Wt., lbs. |          | Section Dia. | Approximate Dimensions |        |        |
|--------------------|-----------|--------------------------------|----------|--------------|------------------------|--------|--------|
|                    |           | DP                             | TE or XP |              | L                      | W      | H      |
| 1 1/2 KRVS 3/4     | 1750      | 90                             | 90       | 2            | 19                     | 8 1/2  | 8 1/2  |
| 1 1/2 KRVS 1       | 3450      | 100                            | 100      | 2            | 19                     | 8 1/2  | 8 1/2  |
| 1 1/2 KRVS 1 1/2   | 3450      | 130                            | 135      | 2            | 19                     | 8 1/2  | 8 1/2  |
| 1 1/2 KRVS 2       | 3450      | 135                            | 140      | 2            | 19                     | 8 1/2  | 8 1/2  |
| 1 1/2 KRVS 3       | 3450      | 140                            | 150      | 2            | 19                     | 8 1/2  | 8 1/2  |
| 1 1/2 KRVS 5       | 3450      | 175                            | 215      | 2            | 23                     | 10 1/2 | 11     |
| 2 KRVS 1/4         | 1750      | 75                             | 75       | 2 1/2        | 19                     | 9      | 9 1/2  |
| 2 KRVS 1/2         | 1750      | 85                             | 85       | 2 1/2        | 19                     | 9      | 9 1/2  |
| 2 KRVS 3/4         | 1750      | 95                             | 95       | 2 1/2        | 19                     | 9      | 9 1/2  |
| 2 KRVS 1           | 3450      | 135                            | 140      | 2 1/2        | 19                     | 9      | 9 1/2  |
| 2 KRVS 1 1/2       | 3450      | 140                            | 145      | 2 1/2        | 19                     | 9      | 10 1/2 |
| 2 KRVS 2           | 3450      | 145                            | 155      | 2 1/2        | 19                     | 9      | 10 1/2 |
| 2 KRVS 3           | 3450      | 180                            | 220      | 2 1/2        | 23                     | 10 1/2 | 10 1/2 |
| 2 KRVS 5           | 3450      | 200                            | 250      | 2 1/2        | 23                     | 10 1/2 | 11     |
| 3 KRVS 1/4         | 1750      | 95                             | 95       | 3            | 19 1/2                 | 10 1/2 | 11 1/2 |
| 3 KRVS 1/2         | 1750      | 105                            | 105      | 3            | 19 1/2                 | 10 1/2 | 11 1/2 |
| 3 KRVS 3/4         | 1750      | 145                            | 145      | 3            | 19 1/2                 | 10 1/2 | 11 1/2 |
| 3 KRVS 1           | 3450      | 150                            | 160      | 3            | 19 1/2                 | 10 1/2 | 12 1/2 |
| 3 KRVS 1 1/2       | 3450      | 155                            | 165      | 3            | 19 1/2                 | 10 1/2 | 12 1/2 |
| 3 KRVS 2           | 3450      | 190                            | 230      | 3            | 23                     | 12 1/2 | 12 1/2 |
| 3 KRVS 3           | 3450      | 210                            | 260      | 3            | 23                     | 12 1/2 | 12 1/2 |
| 3 KRVS 5           | 3450      | 260                            | 350      | 3            | 25 1/4                 | 12 1/2 | 12 1/2 |
| 3 KRVS 10          | 3450      | 320                            | 450      | 3            | 25 1/4                 | 12 1/2 | 12 1/2 |

Type-50 Two-Stage  
Reciprocating  
Air Compressors

**INGERSOLL-RAND.**  
AIR COMPRESSORS



### A compressor you can count on.

In the 1½ to 30 hp class, no other compressor can match the Ingersoll-Rand Two-Stage Reciprocating Type 30 for reliability, versatility, and ease of installation.

The T-30 has proved its reliability in over one million installations all over the world. Its tried-and-true design has made it the number one seller in its horsepower range.

Count on the T-30 to be there for you when you need it. It won't let you down. After all, it's the pick of professionals—and it's backed by the leader in long-lasting air compressors, Ingersoll-Rand.

### Designed for maximum performance

#### Heat-fighting finned intercooler

Finned copper tubing dissipates heat six times faster than bulk cast iron. Number of tubes per nest increases with compressor capacity—as many as 20 are used. The result is a cooler-running, more efficient compressor that uses less power.

#### Rugged one-piece connecting rods

No adjustment required. Overhung

crankshaft design makes possible solid-end connecting rods. No bolts and nuts to come loose.

#### Separate cast cylinders

Each cylinder is separately cast, precision-bored to close tolerances, and bolted to the crankcase. If a cylinder fails, only that one cylinder needs replacement—no need to replace the entire crankcase block. The heat of compression is dissipated by the deep radial fins on the cylinder head. The air flow from the flywheel is drawn across the cylinder to remove this heat from the compressor.

#### Balanced overhung crankshaft

Stiff, overhung crankshaft rotates on two liberally sized, heavy-duty ball bearings for long life. Precision ground, replaceable crankpin bushing is perfectly aligned. Entire shaft is precision-balanced, runs with minimum vibration.

#### Centrifugal unloader

On higher horsepower motors where the starting torque of the motor requires extra time for the compressor to come up to speed, the centrifugal

unloader prevents the compressor from starting under load. Eliminates the possibility of stalling or burning out the motor. Standard on 71T2, 15T and 30T compressors.

#### Continuous low-level oil protection

Optional tamperproof switch, where supplied, automatically stops compressor if crankcase oil level gets too low. Functions continuously and cannot be reset without adding oil.

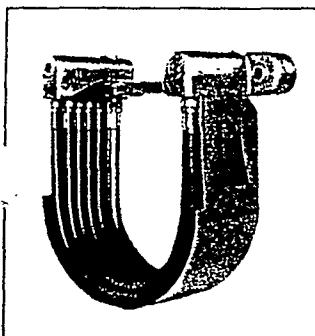
#### Quick-acting finger valve

Made of heat-treated stainless steel. Large flow area, less heat and carbon build-up than with multiple small valves. Standard on 234, 242 and 253 compressors.

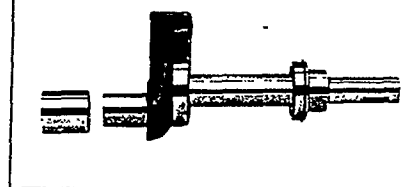
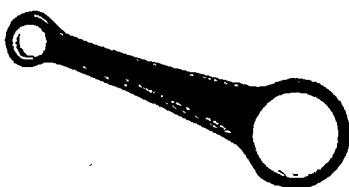
#### Concentric ring valve

High-quality stainless steel, with concentric inlet and discharge rings. Large flow area for longer valve life. Standard on 71T2, 15T and 30T compressors.

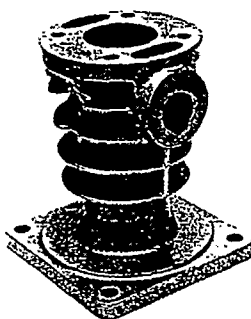
Finned Intercooler



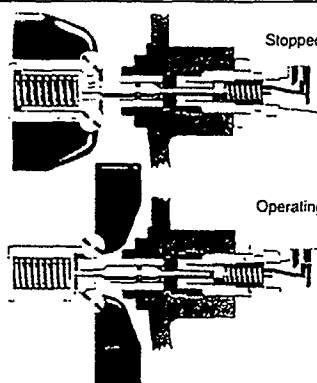
One Piece Connecting Rod



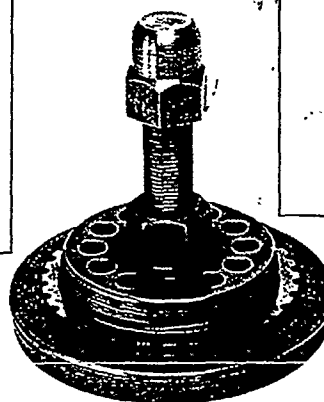
Balanced Overhung Crankshaft



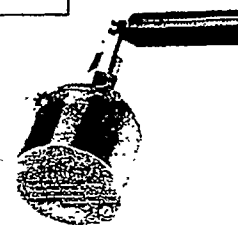
Separate Cast Cylinders



Centrifugal Unloader



Concentric Ring Valve



Continuous Low-Level Oil Protection

Finger Valve

